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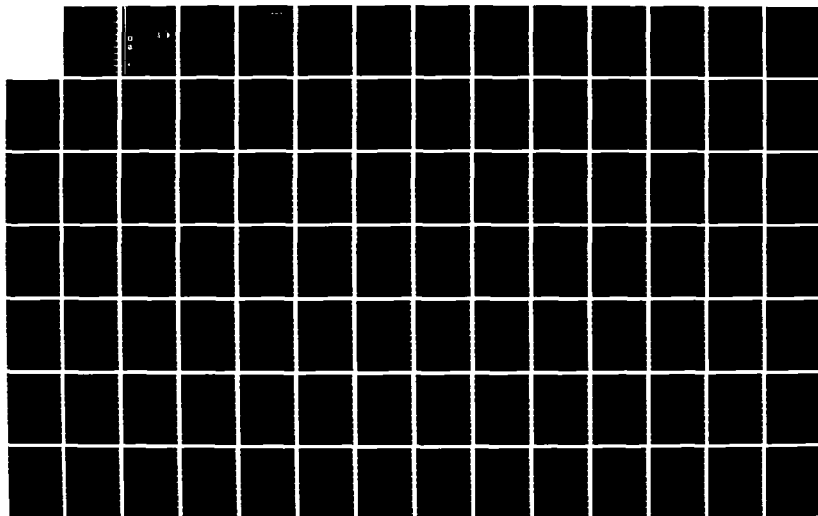
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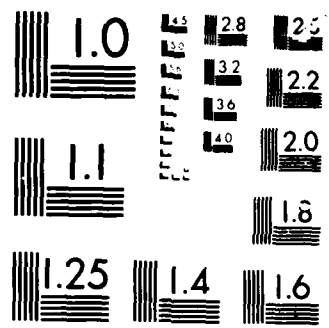
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A Semi-Empirical, Low-Latitude Ionospheric Model

DAVID N. ANDERSON
MICHAEL MENDILLO
BRUCE HERNITER

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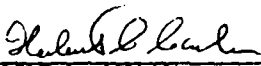
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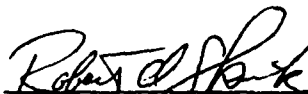
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19 ABSTRACT (Continue on reverse if necessary and identify by block number) Since current empirical models specifying low-latitude electron density profiles severely underestimate the daytime plasma density scale height and total electron content (TEC), a Semi-empirical, Low-latitude, Ionospheric Model (SLIM) was developed which is not only more realistic but is also computationally fast. Electron density profiles (180 to 1800 km) are theoretically calculated as a function of latitude (every 2° between 24° N and 24° S dip latitude) and local time (every half hour over 24 hours LT) by solving the time-dependent plasma continuity equation. Assuming a Chapman-like profile, sets of coefficients are then generated which reproduce these individual profiles. The coefficients themselves are easily stored, quickly retrieved and form the basis for a fast, portable, semi-empirical computer code. This report describes briefly the input parameters used to theoretically calculate profiles and the procedures used to generate the coefficients. The SLIM profiles are compared with the Chan and Bent empirical models for Equinox, solar maximum conditions. Finally electron densities, the coefficients, TEC and 6300 Å				
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airglow intensities are listed in tabular form for three seasons (Equinox, June solstice, and December solstice) and two solar cycle periods (solar maximum and solar minimum).

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Preface

We would like to thank Jeffrey Forbes, Bela Fejer, Leo McNamara, John Klobuchar and Jeffrey Baumgardner for numerous discussions and their helpful suggestions. We also wish to thank Celeste Gannon and Patricia Falcione for their help in manuscript typing and preparation. This research was supported in part by AFGL Contract F19628-81-K-0051 with Boston University. Michael Hicks produced the graphs using the RS/1 package on the Boston University Department of Astronomy VAX-11/750. Thanks also to the staff of the AFGL Computer Center for their help.



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A Semi-Empirical, Low-Latitude Ionospheric Model

1. INTRODUCTION

1.1 Background

Current empirical models of the low-latitude ionospheric F-region (Llewellyn and Bent;¹ Chiu;² and Rawer³) can severely underestimate the daytime plasma density scale-height and total electron content (TEC) when compared with actual observations. As illustrated in Figure 1, the International Reference Ionosphere (IRI) described by Rawer³ yields daytime TEC values which are 50 percent lower than observed TEC values at Manila (dip 14.5° N) in January 1982 (McNamara⁴). Some improvement occurs when the Bent topside model is incorporated with the IRI bottomside models but the predicted values are still lower than observed. Substantial improvement is achieved when theoretically calculated profiles (Anderson⁵) are used to predict TEC values. The reason is that vertical plasma transport by upward $\mathbf{E} \times \mathbf{B}$ drift produces both topside and bottomside profiles which are much broader (thicker) than Chapman-like profiles.

To calculate electron density profiles whenever they are needed, however, is prohibitively time-consuming on even the fastest computer. An alternate solution to this problem is to theoretically calculate electron density profiles as a function of latitude and local time and then generate coefficients which reproduce these profiles.

(Received for publication 9 October 1985)

(Due to the large number of references cited above, they will not be listed here. See References, page 101.)

The coefficients themselves are easily stored, quickly retrieved and form the basis for a fast, portable, semi-empirical computer code which will produce realistic low-latitude F-region electron density profiles. The results of this technique are called the Semi-empirical Low-latitude Ionospheric Model (SLIM).

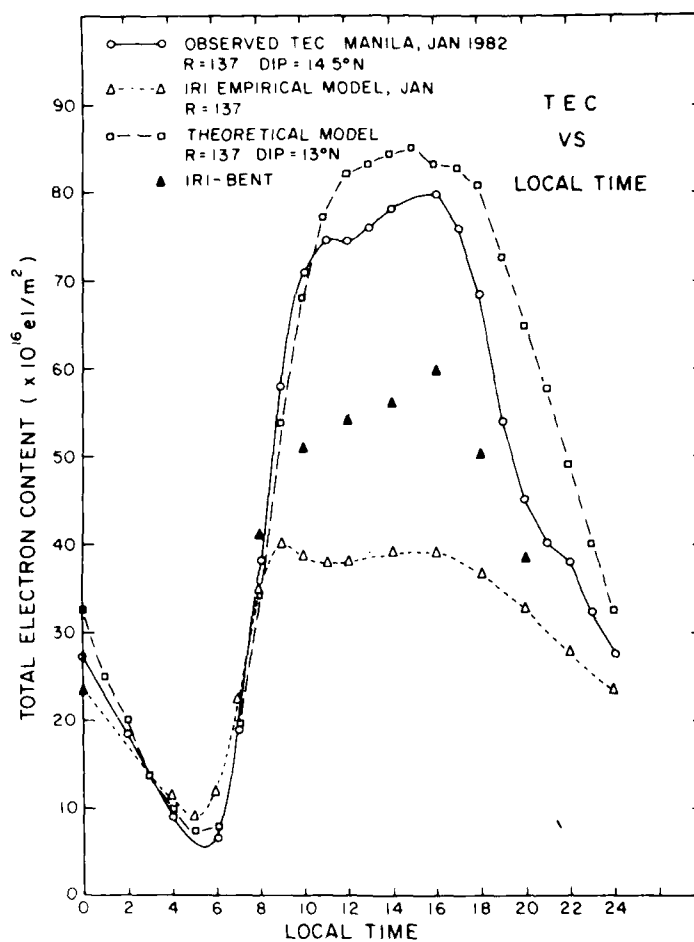


Figure 1. A Comparison Between Observed, Predicted, and Theoretically Calculated Total Electron Content (TEC) Values at Manila as a Function of Local Time for January 1982

Using the techniques described by Anderson,⁵ electron densities as a function of altitude, latitude and local time are calculated by solving the time-dependent ion (10^4) continuity equation numerically. The effects of production by photo-ionization, loss through charge exchange with N_2 and O_2 and transport by diffusion,

neutral winds and vertical $\bar{E} \times \bar{B}$ drift are included. Because $\bar{E} \times \bar{B}$ drifts play such an important role in determining the electron density distribution (Hanson and Moffett⁶ and Anderson⁵) and have a seasonal and solar cycle dependence (Fejer et al⁷), the calculations are carried out for equinox and solstice conditions for both solar cycle maximum and minimum periods.

Once electron density profiles are obtained, they are normalized to the peak electron density, $N_{\max}$ and appropriate coefficients which reproduce the normalized profiles (180-1800 km) every half-hour local time and every 2° dip latitude are calculated. To regenerate density profiles simply requires specifying $N_{\max}$ internally (that is, re-use of the theoretical $N_{\max}$ values) or by externally using an empirical model such as CCIR,⁸ or observed foF2 values, and then applying the calculated coefficients applicable to the specified latitude and local time location. In the following sections, we describe briefly the various input parameters which were used in calculating theoretically the electron density profiles from the time-dependent continuity equation. The last section compares the current Chiu and Bent empirical profiles with SLIM profiles at specific latitudes and local times for equinox, solar cycle maximum conditions.

1.2 Model Calculations

The ion (O^+) continuity equation is given by

$$\frac{\partial N_i}{\partial t} + \bar{\nabla} \cdot (N_i \bar{V}_i) = P_i - L_i \quad (1)$$

where $N_i (= N_e)$ is the ion density; P_i , the ion production rate; L_i , the ion loss rate; and $\bar{V}_i$, the ion transport velocity. In the ionosphere, plasma is transported along geomagnetic field lines by diffusion and neutral winds and perpendicular to field lines primarily by $\bar{E} \times \bar{B}$ drift (Kendall and Pickering⁹). Solving Eq. (1) at low-latitudes is facilitated by transforming the independent coordinates r , θ and ϕ to a coordinate system parallel and perpendicular to $\bar{B}$ (see Anderson⁵).

Equation (1) can be written

6. Hanson, W.B., and Moffett, R.J. (1966) Ionization transport effects in the equatorial F-region, J. Geophys. Res., 71:5559.
7. Fejer, B.G., Farley, D.T., Woodman, R.F., and Calderon, C. (1979) Dependence of equatorial F-region vertical drifts on season and solar cycle, J. Geophys. Res., 84:5792.
8. International Radio Consultative Committee (CCIR) (1978) CCIR atlas of ionospheric characteristics, Rep. 340-3 Recommendations and Reports of the CCIR, Vol. 6, International Telecommunications Union, Geneva.
9. Kendall, P.C., and Pickering, W.M. (1967) Magnetoplasma diffusion at F2-region altitudes, Planet. Space Sci., 15:825.

$$\frac{\partial N_i}{\partial t} + \bar{V}_{i\perp} \cdot \bar{\nabla} N_i = P_i - L_i - \bar{\nabla} \cdot (N_i \bar{V}_{i\perp}) - N_i \bar{\nabla} \cdot \bar{V}_{i\perp} \quad (2)$$

where $\bar{V}_{i\perp}$ is given by $\bar{E} \times \bar{B}/B^2$ and $V_{i\parallel}$ includes the effects of plasma diffusion and neutral wind. The right-hand side of the equation involves terms which are second order in the coordinate parallel to $\bar{B}$. The left-hand side of Eq. (2) is the time rate of change of plasma density in a frame of reference which drifts with the $\bar{E} \times \bar{B}$ drift velocity. Equation (2) is solved numerically to give ion densities as a function of altitude, latitude and local time [see Moffett¹⁰ for a review of transformations and numerical solutions].

The set of coefficients for the ion continuity equation is obtained from models of the neutral composition, ion and electron temperatures, and production, loss and diffusion rates as well as $\bar{E} \times \bar{B}$ drift and neutral wind models. Briefly, the models are the following:

(1) The MSIS (Hedin¹¹) neutral atmospheric model is used to calculate N_2 , O_2 , and O densities and the neutral temperature, T_n , as a function of altitude, latitude and local time. An F10.7 cm flux of 180 units is chosen to represent solar cycle maximum period, and 70 units for solar minimum conditions. Average geomagnetic conditions were chosen by setting $A_p = 15$ in the MSIS model.

(2) Production and diffusion rates are similar to those used by Anderson.⁵ For the photoionization rate at the top of the atmosphere, P_∞ , a value of $5.5 \times 10^{-7} \text{ sec}^{-1}$ represents solar cycle maximum conditions, with a value of $2.3 \times 10^{-7} \text{ sec}^{-1}$, for solar minimum conditions. The loss rate coefficient are adopted from Torr and Torr.¹²

(3) Plasma temperatures were chosen by adopting T_e/T_n and T_i/T_n ratios as a function of local time, altitude and season from the IRI model and then applying those ratios to the T_n results obtained from MSIS. Figure 2 illustrates the ratio behavior for the sunspot maximum Equinox case.

10. Moffett, R.J. (1979) The equatorial anomaly in the electron distribution of terrestrial F-region, Fund. Cosm. Phys., 4:313.

11. Hedin, A.E. (1983) A revised thermospheric model based on mass spectrometer and incoherent scatter data; MSIS-83, J. Geophys. Res., 88:10,170

12. Torr, M.R., and Torr, D.G. (1979) Chemistry of the thermosphere and ionosphere, J. Atmos. Terr. Phys., 41:797.

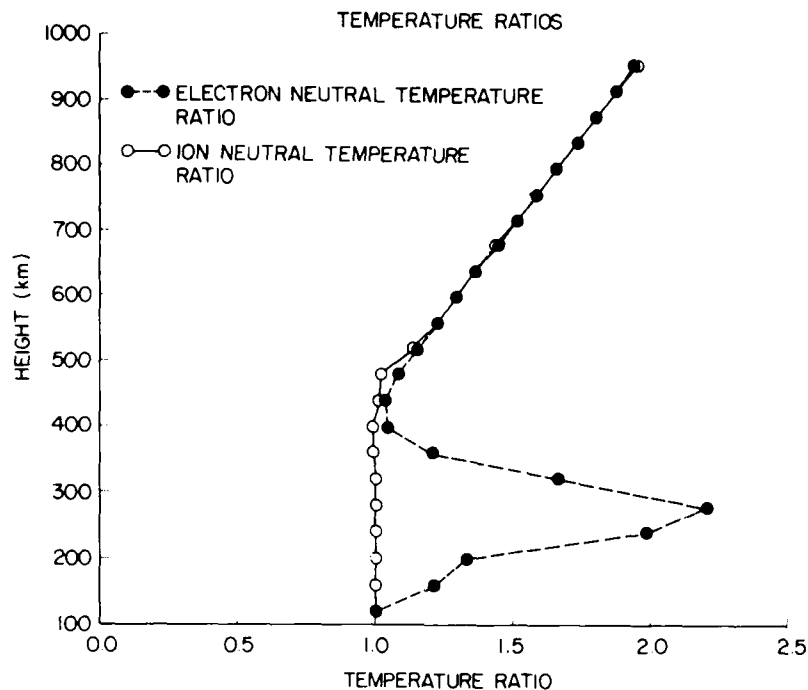


Figure 2. Ion-neutral and Electron-neutral Temperature Ratios as a Function of Altitude. The neutral temperature is adopted from the MSIS model atmosphere (see text for details)

(4) The vertical $\bar{E} \times \bar{B}$ drift velocity observed by Woodman¹³ is essential in producing and maintaining the electron density distribution observed near the magnetic equator. We adopt six vertical drift models to represent, respectively, three seasons (equinox, summer and winter solstices) at solar cycle maximum and solar cycle minimum periods. The different drift patterns are based primarily on the Jicamarca incoherent scatter radar observations reported by Fejer et al.⁷ We have assumed the vertical drift velocity is independent of altitude. The east-west component of $\bar{E} \times \bar{B}$ drift reported by Fejer et al.¹⁴ is neglected in the calculations because its effect on electron density profiles is negligible (Anderson¹⁵). Figures 3a, 3b and 3c display the diurnal variation in drift for the Equinox, June solstice and December solstice cases, for solar maximum and minimum, respectively.

13. Woodman, R. F. (1970) Vertical drift velocities and east-west electric fields at the magnetic equator, *J. Geophys. Res.*, **75**:6249.

14. Fejer, B. G., Farley, D. T., Gonzales, C. A., Woodman, R. F., and Calderon, C. (1981) F-region East-West drifts at Jicamarca, *J. Geophys. Res.*, **86**:215.

15. Anderson, D. N. (1981) Modeling the ambient low-latitude F-region ionosphere - A Review, *J. Atmos. Terr. Phys.*, **43**:753.

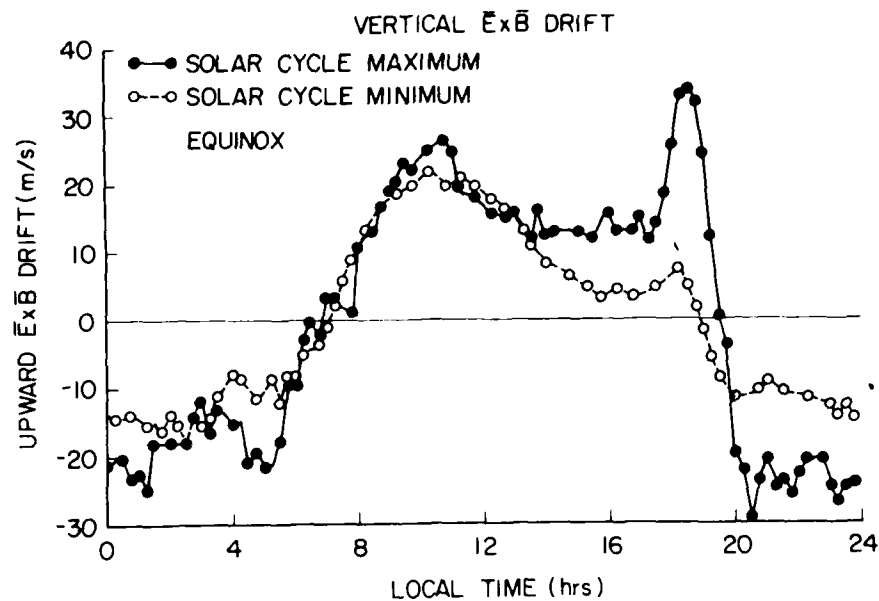


Figure 3a. Vertical $\bar{E} \times \bar{B}$ Plasma Drift as a Function of Local Time During Solar Cycle Maximum and Minimum Periods for Equinox Conditions

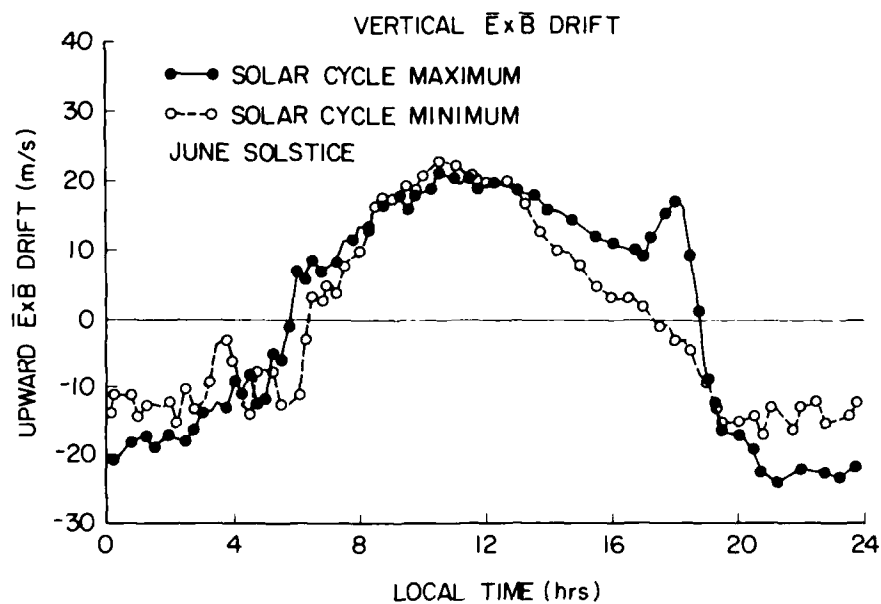


Figure 3b. Vertical $\bar{E} \times \bar{B}$ Plasma Drift as a Function of Local Time During Solar Cycle Maximum and Minimum Periods for June Solstice Conditions

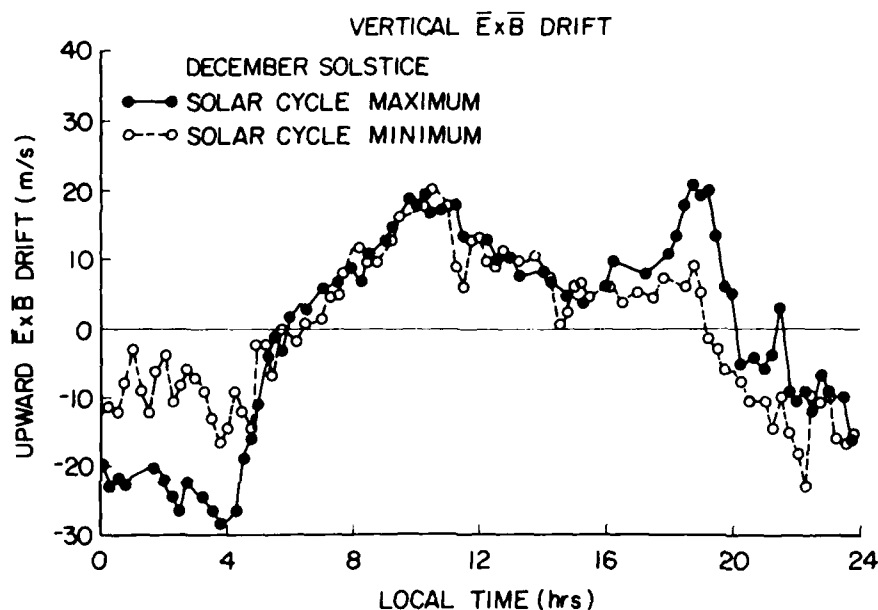


Figure 3c. Vertical $\bar{E} \times \bar{B}$ Plasma Drift as a Function of Local Time During Solar Cycle Maximum and Minimum Periods for December Solstice Conditions

(5) The geomagnetic field is represented by a dipole model whose axis is aligned with the earth's rotational axis. We incorporate $\bar{E} \times \bar{B}$ drift models appropriate to the American sector where the dip equator lies 12° south of the geographic equator, and thus longitude effects are not addressed at this time. Further development of the model will include a tilted dipole geomagnetic field with declination specified over the regions of interest.

(6) A simple analytic formulation for the meridional neutral wind field is adopted which makes use of observations and theory. It is constructed on the basis of observed mean (DC), diurnal (24-hour), semidiurnal (12-hour), and terdiurnal (8-hour) harmonics at Arecibo (18° N), Millstone Hill (42° N) and St. Santin (45°), with latitude variations of amplitude and phase obtained from theoretical (numerical) simulations (Forbes^{16, 17}). The general latitudinal pattern assumed is guided by

16. Forbes, J. M. (1982a) Atmospheric Tides 1. Model description and results for the solar diurnal component, *J. Geophys. Res.*, 87:5222.

17. Forbes, J. M. (1982b) Atmospheric Tides 2. The solar and lunar semi-diurnal components, *J. Geophys. Res.*, 87:5241.

the tidal calculations of Forbes^{16, 17} and the zonal mean velocities presented by Roble et al.¹⁸ The analytic expressions, valid only for latitudes $|\theta| \leq 45^\circ$, are given in Table 1 for Equinox, December solstice and June solstice periods.

For solstice conditions, the diurnal component, V_{24} , is shifted 10° in latitude in the direction of the solar bulge (consistent with Forbes¹⁶). The Roble et al.¹⁸ mean meridional winds, V_0 , during solstice are shifted downwards by about 40 m/sec so that the transequatorial amplitudes are of the order 50 m/sec and the winter hemisphere reversal occurs near Millstone Hill.

The solstitial modifications to the mean and diurnal components adequately account for the main features of the observed seasonal-latitudinal dependence of the meridional wind for our purposes. Seasonal variations in the semi-diurnal and terdiurnal components are neglected. Figures 4a, 4b, and 4c give contour plots of the overall wind model spanning the simulation region where positive values represent north-to-south winds. Finally, it should be noted that while EUV varies markedly over a solar cycle, the associated variations in ion drag suppress solar cycle variations in the tidal winds, although neutral temperatures vary considerably. Therefore, we have assumed the current wind model parameterization to be independent of solar activity.

18. Roble, R.G., Dickinson, R.E., and Ridley, E.C. (1977) Seasonal and solar cycle variations of the zonal mean circulation in the thermosphere, J. Geophys. Res., 82:5493.

Table 1. Analytic Wind Equations

Equinox		θ is latitude in degrees	
V_0	$=$	$8.61 \times 10^{-3} * \theta^2 \frac{\theta}{ \theta }$	
V_{24}	$=$	$2 \theta \cos \frac{2\pi}{24} (t - 18 - \frac{ \theta }{7})$	
V_{12}	$=$	$50 \sin (\frac{\pi}{180} * \frac{10}{3} \theta) \cos \frac{2\pi}{12} (t - 9 - \frac{ \theta }{12})$	
V_8	$=$	$0.38 \theta \cos \frac{2\pi}{8} (t - 8.2 + 0.079 \theta)$	
V_{TOT}	$=$	$V_0 + V_{24} + V_{12} + V_8$	
December Solstice			
V_0	$=$	$3.116 \times 10^{-4} * \theta^2 (\theta + 45) - 49$	
V_{24}	$=$	$2 \theta_{24} \cos \frac{2\pi}{24} (t - 18 - \frac{ \theta_{24} }{7})$	where $\theta_{24} = \theta + 10$
V_{12}	$=$	$50 \sin (\frac{\pi}{180} * \frac{10}{3} \theta) \cos \frac{2\pi}{12} (t - 9 - \frac{ \theta }{12})$	
V_8	$=$	$0.38 \theta \cos \frac{2\pi}{8} (t - 8.2 + 0.079 \theta)$	
V_{TOT}	$=$	$V_0 + V_{24} + V_{12} + V_8$	
June Solstice			
V_0	$=$	$-3.116 \times 10^{-4} * \theta^2 (45 - \theta) + 49$	
V_{24}	$=$	$2 \theta_{24} \cos \frac{2\pi}{24} (t - 18 - \frac{ \theta_{24} }{7})$	where $\theta_{24} = \theta - 10$
V_{12}	$=$	$50 \sin (\frac{\pi}{180} * \frac{10}{3} \theta) \cos \frac{2\pi}{12} (t - 9 - \frac{ \theta }{12})$	
V_8	$=$	$0.38 \theta \cos \frac{2\pi}{8} (t - 8.2 + 0.079 \theta)$	

Table 1. Analytic Wind Equations (Contd)

where

$$V_{TOT} = V_0 + V_{24} + V_{12} + V_8 \quad (\text{m/sec})$$

t = hours, local time

θ = geographic latitude, positive northern hemisphere

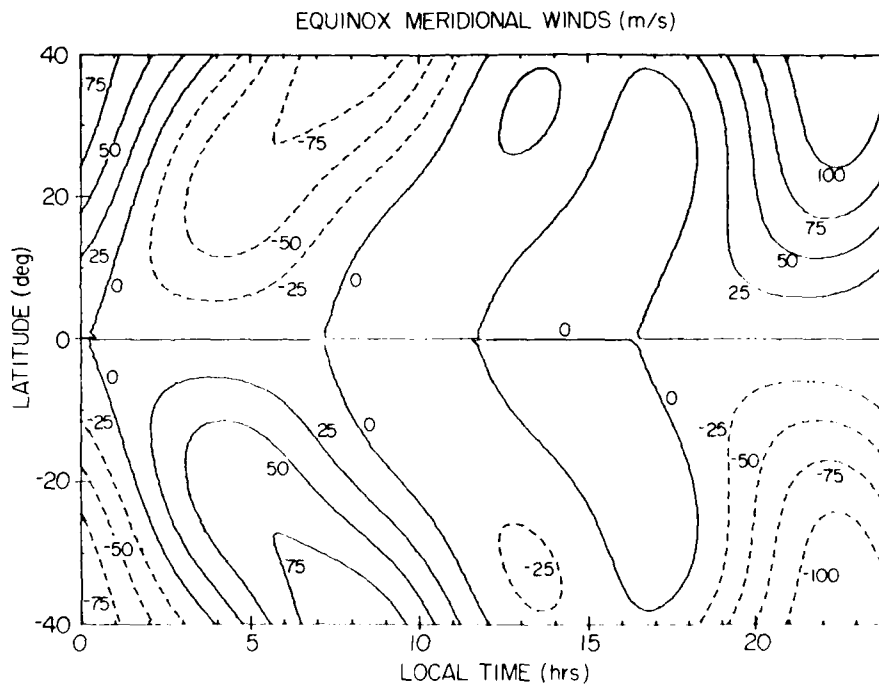


Figure 4a. Contour Plot of Meridional Neutral Wind as a Function of Latitude and Local Time for Equinox Periods. Positive values represent north-to-south winds

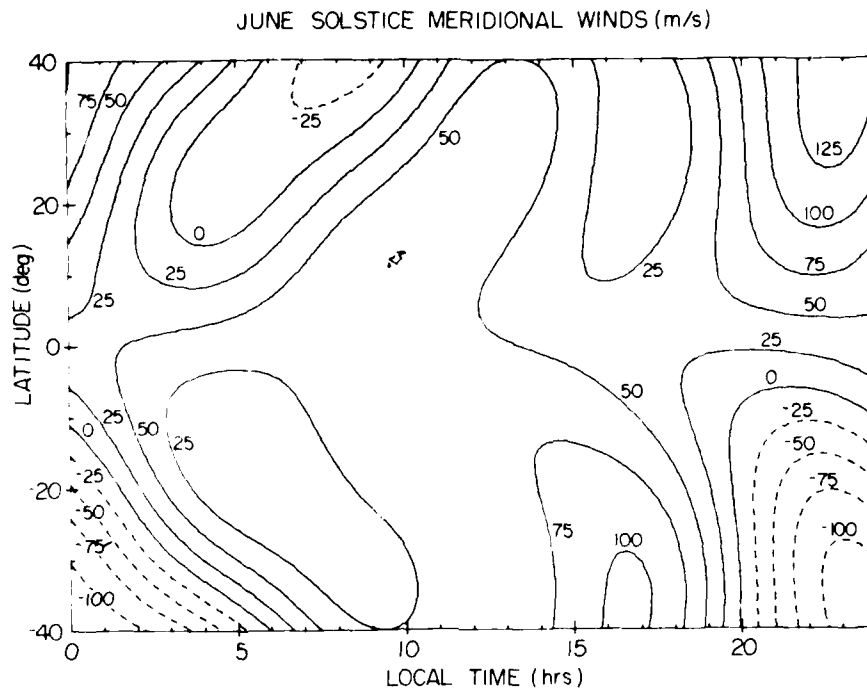


Figure 4b. Contour Plot of Meridional Neutral Wind as a Function of Latitude and Local Time for June Solstice Periods. Positive values represent north-to-south winds

2. THE SEMI-EMPIRICAL APPROACH

2.1 The SLIM Database

As described in Section 1.1, the theoretical model is used to produce six preliminary databases. Three of these runs are for sunspot minimum ($F10.7 = 70$, $A_p = 15$) during the June solstice, December solstice, and Equinox seasons. The remaining three are for sunspot maximum ($F10.7 = 180$, $A_p = 15$) during the same seasons. Each record of data consists of profile parameters stored for a fixed geographic (geomagnetic) point and fixed time. Each database covers 25 latitudes ($24^\circ\text{S} - 24^\circ\text{N}$, every 2°) and 48 times (0000h - 2330h, every 30 min). A subset of the SLIM data set, using a more coarse resolution ($N_c(h)$ every 4° in latitude and every hour of local time) is presented in tabular format for easy access and reference (Table 2).

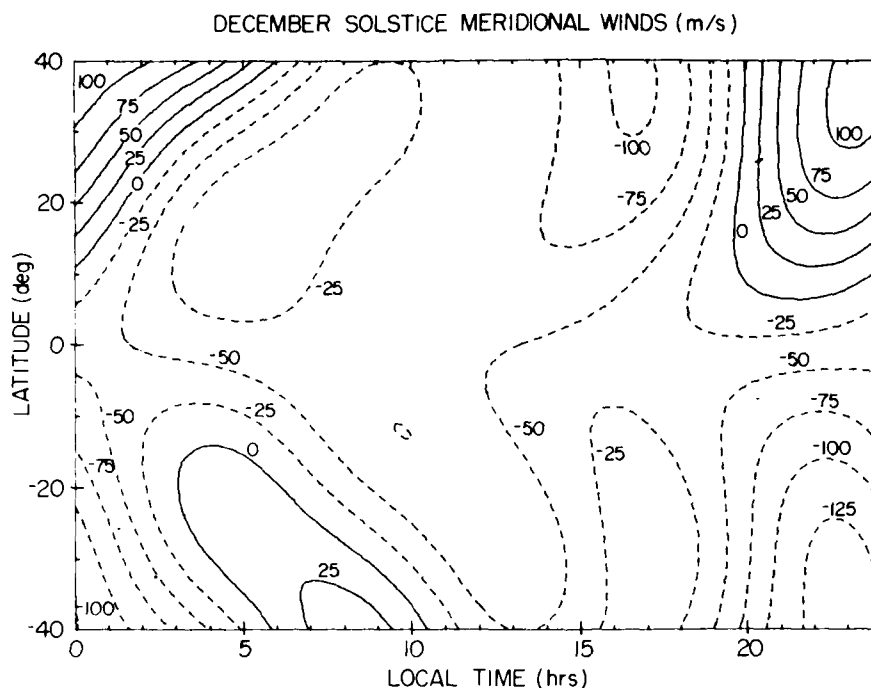


Figure 4c. Contour Plot of Meridional Neutral Wind as a Function of Latitude and Local Time for December Solstice Periods. Positive values represent north-to-south winds

The core of the SLIM approach is to identify a relatively simple $N_e(h)$ function that will have a small number of coefficients and yet provide a good representation of the profiles calculated from the theoretical model. As guiding principles, it was decided that: (1) maximum accuracy was required near the F-region peak (in both density and height), and (2) while some errors in N_e could be accepted well below or above h_{max} , the overall profile (as represented by the total electron content, (TEC) parameter) had to reproduce the theoretical results to within 5 percent or less.

The Chapman profiles developed in the earliest days of ionospheric physics offer a simple way to explain the vertical structure of plasma in the upper atmosphere. They are based on relatively simple physics and thus cannot be used to represent the entire $N_e(h)$ profiles that emerge from the more sophisticated simulation techniques in use today. As simple mathematical formulas, however, they are well-suited for representing portions of the ionospheric profile. Specifically, while a

single Chapman profile cannot fit entire $N_e(h)$ profile, separate Chapman formulas can be used to reproduce the topside and bottomside components of the overall profiles with good results. It was decided, therefore, to define a "generalized" or "modified" Chapman formula with coefficients that vary for each topside and bottomside component of the $N_e(h)$ profile. The function used to fit the theoretically-derived profiles was thus chosen to be:

$$N_e(h) = N_{\max} \exp [c(1 - z - e^{-z})]$$

$$z = \frac{(h - h_{\max})}{A} \quad (3)$$

In using Eq. (3), six parameters (or coefficients) are needed to reproduce the $N_e(h)$ profile: $N_{\max}$, $h_{\max}$, c_{up} , A_{up} , c_{lo} , A_{lo} . The advantages of this method are: (1) the fit achieves 100 percent accuracy at $N_{\max}$ and $h_{\max}$ since they are themselves input coefficients; (2) the topside and bottomside Chapman-type functions guarantee continuity of both density and its first derivative across the fit boundary; and (3) with a fit technique weighted by density values (see below), the c 's and A 's chosen emphasize maximum accuracy in regions near the peak.

Included on each record of the database are two other numbers available for use and/or inspection. These are: (1) the total electron content (TEC) obtained by integrating the SLIM profile from 180 to 1800 km; and (2) 6300 Å emission calculated from O_2^+ recombination chemistry only (and therefore, appropriate for post-sunset airglow).

2.2 Production Details

There are four steps and one version of the database is produced after each step. Initially, the theoretical model LOLAT is used to produce Database 1 (DB1). DB1 simply contains the electron density and accompanying heights. The model solves the O^+ continuity equation, fieldline-by-fieldline, starting at the highest altitude. The order of the density and height arrays are latitude, time, and fieldline. The computer file is sequential.

Database 1 is not organized into actual electron density profiles. It is the job of program SEQDIR to sort the densities by height, time, and latitude. In addition, SEQDIR creates Database 2 (DB2) as a direct access file. A direct access file is

one in which each record of the file can be individually accessed without reading any other record. In DB2, each record contains a profile of electron densities and a height array for a particular time and latitude.

Database 2 has the disadvantage that the electron densities are given at unevenly spaced height intervals. EVEN is the program used to interpolate between the given values. The resulting profile records contain values at every 20 km from 180 to 1000 km and every 100 km from 1000 to 1800. The interpolation is done with the National Center for Atmospheric Research (NCAR) family of cubic spline interpolation, derivative and integration routines called CURV. The derivative routine is used to determine the peak electron density by identifying heights where the derivative changes sign. Arrays of the densities at these heights are scanned for the maximum value, which is identified as $N_{\max}$. The density profile is stored at predetermined heights so that the height array is no longer needed, making Database 3 (DB3) much smaller than DB2. TEC from 180 to 1800 km is also calculated using the CURV routines and included in each DB3 record.

Database 4 is the result of program CHAP fitting the profiles in DB3 to the generalized Chapman formula [Eq. (3)]. $N_{\max}$ and $h_{\max}$ are known from DB3. Combinations of values of c and A are tested until the sum of the square of the differences,

$$\sigma(c, A) = \sum_{i=1}^n \left\{ N_e^{\text{Chap}}(c, A, h_i) - N_e^{\text{DB3}}(h_i) \right\}^2$$

is minimized. The range of values for c and A in the first loop is

$$c = \frac{1}{16} \rightarrow 2.0, \quad \Delta c = \frac{1}{16} \quad A = 10.0 \rightarrow 200.0 \text{ km}, \quad \Delta A = 10.0 \text{ km}.$$

If the minimum occurs at the endpoint of either range, the range is extended and the cycle is repeated with the same Δc and ΔA . Once an initial c and A are selected (c' , A'), a new cycle is started where

$$c = (c' - \frac{1}{16}) \rightarrow (c' + \frac{1}{16}), \quad \Delta c = \frac{1}{256}$$

$$A = (A' - 10.0) \rightarrow (A' + 10.0), \quad \Delta A = 1.0.$$

To save space, the C quoted in the SLIM tables is actually

$$C = 1000 * c.$$

The final c and A values are added to DB4 and TEC is recalculated.

The end product is the SLIM database (DBSLIM), the ensemble of the DB4's for the six conditions of solar cycle and season.

3. COMPARISON WITH EMPIRICAL MODELS

Figure 5 compares the Semi-empirical, Low-latitude, Ionospheric Model (SLIM) with the Chiu and Bent models for Equinox, solar maximum conditions at 1400 LT. The daytime upward $\bar{E} \times \bar{B}$ drift pictured in Figure 3a causes the broad F-region profile. Respective topside scale heights at 700 km are 540 km, 150 km and 115 km. Integrating the electron density profiles with altitude give total electron contents (TEC) of 97, 48, and 61 ($\times 10^{12}$ el/cm²), respectively. The bottom portion of Figure 5 shows the comparison at 16° S dip latitude at the crest of the equatorial anomaly. Although the SLIM topside scale height is not as large as at the magnetic equator, it is still larger than those given by Chiu or Bent. In addition, the $N_{\max}$ value of 3.5×10^6 el/cm³ is significantly larger than the value at the magnetic equator due to the combination of upward and poleward $\bar{E} \times \bar{B}$ drift and downward diffusion. Note that neither the Chiu or Bent profiles show any significant change with latitude.

The most dramatic differences between SLIM and the empirical models occurs just after sunset around 2000 LT and pictured in Figure 6. At the magnetic equator (top portion), the post-sunset enhancement in upward drift lifts the F-layer to 600 km compared to $h_{\max}$ values of 450 km and 350 km for Bent and Chiu models, respectively. Such differences in $h_{\max}$ would cause significant differences in the estimated 6300 Å airglow intensity and the ion-neutral drag coefficient in the neutral momentum equation.

At 16° S dip latitude (bottom portion of Figure 6) the same upward drift causes an enhancement in $N_{\max}$. The calculated value is 5×10^6 el/cm³ compared with 2×10^6 el/cm³ for Chiu and 8×10^5 el/cm³ for the Bent model. Respective TEC values ($\times 10^{12}$ el/cm²) are 139, 48 and 19. Finally, Figure 7 gives a comparison between SLIM, Chiu and Bent at 0500 LT. The calculated profiles at the magnetic equator and 16° S dip latitude are much more Chapman-like and in reasonable agreement with the empirical models in both $N_{\max}$, $h_{\max}$ and topside scale height. The calculated value of TEC at 16° S dip latitude (bottom portion) is 5×10^{12} el/cm² which compares favorably with the Bent value of 3.5×10^{12} and a Chiu value of 9×10^{12} el/cm².

Figure 8 compares electron density profiles measured on 5 March 1969, using the Jicamarca incoherent scatter radar facility with calculated density profiles at 1400 LT and 2000 LT. The comparison demonstrates that both the large daytime plasma scale height and the calculated value of $h_{\max}$ at 2000 LT are in reasonable agreement with observed values. Again, it should be emphasized that the profiles are sensitive to the vertical $\bar{E} \times \bar{B}$ drift velocity whose diurnal variation may have significant day-to-day changes.

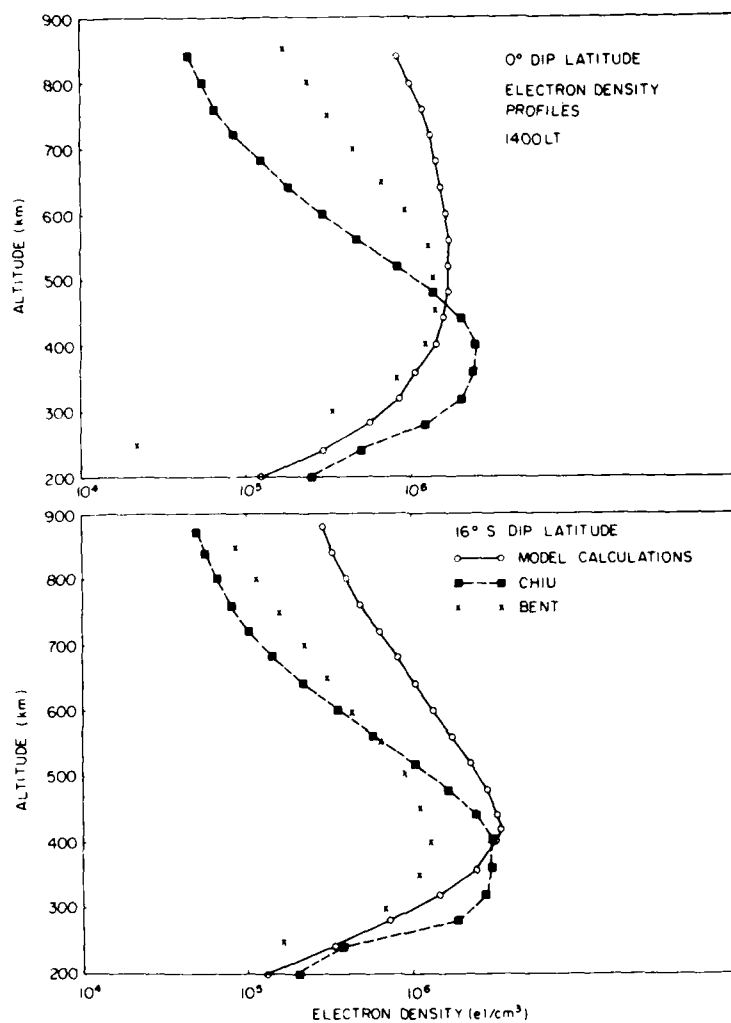


Figure 5. A Comparison Between SLIM-generated Electron Density Profiles (o—o) and the Empirical Models of Chiu (■ ——— ■), and Bent (xxxx) for Equinox, Solar Cycle Maximum Conditions at 1400 LT. Profiles at the magnetic equator (top portion) and at 16° S dip latitude (bottom portion)

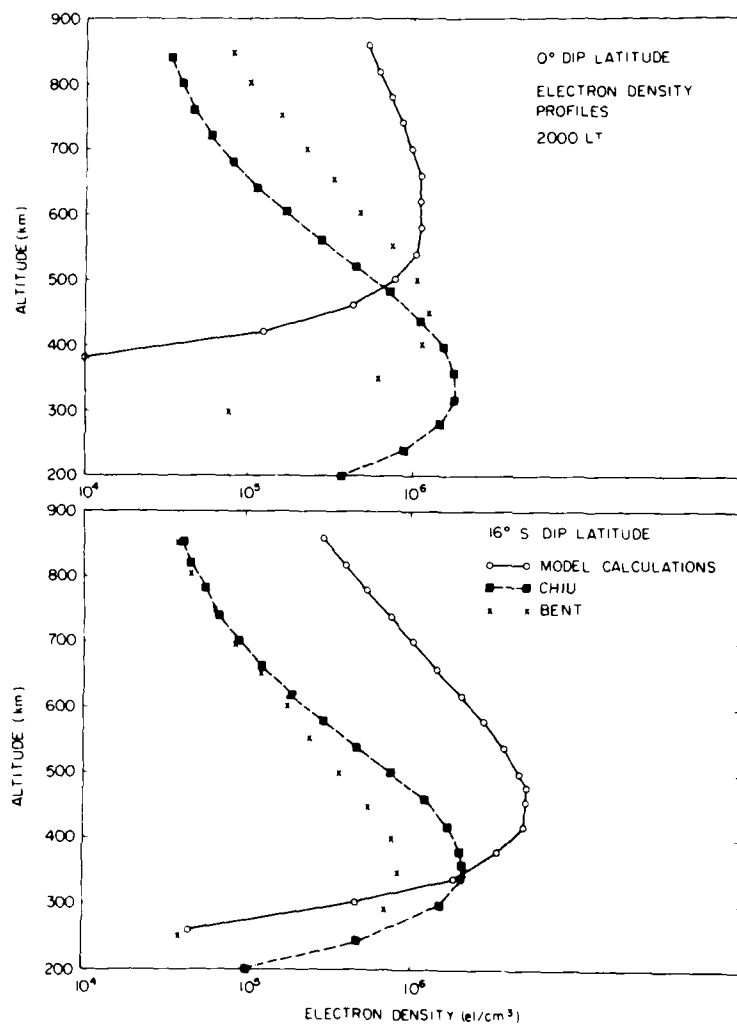


Figure 6. A Comparison Between SLIM-generated Electron Density Profiles (o—o) and the Empirical Models of Chiu (■-----■), and Bent (xxxx) for Equinox, Solar Cycle Maximum Conditions at 2000 LT. Profiles at the magnetic equator (top portion) and at 16° S dip latitude (bottom portion)

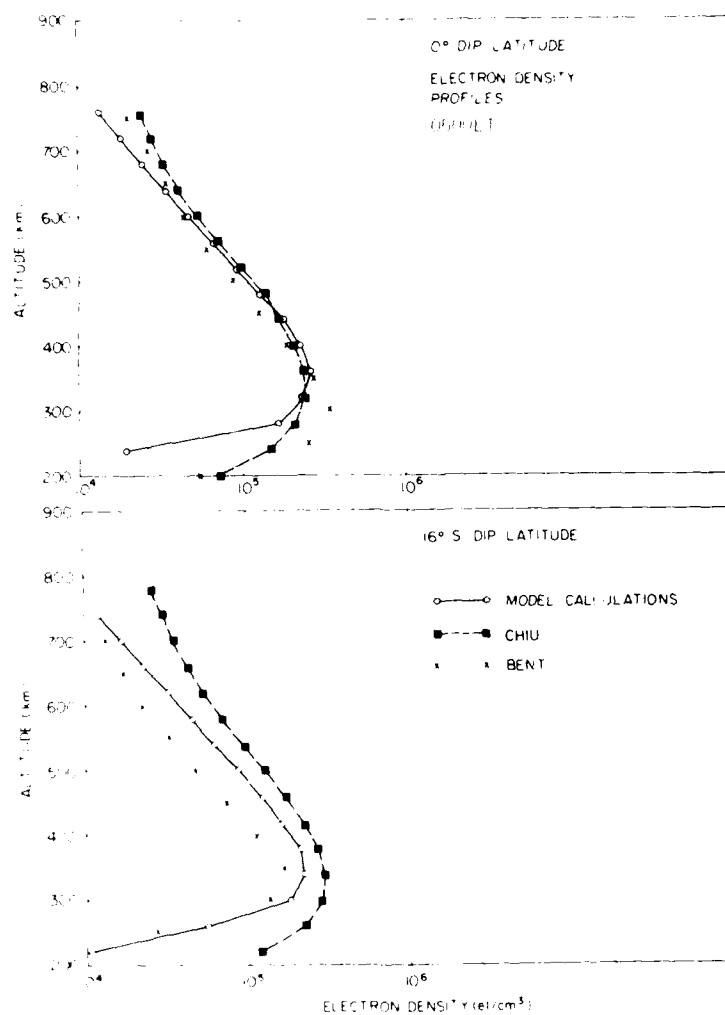


Figure 7. A Comparison Between SLIM-generated Electron Density Profiles (o—o) and the Empirical Models of Chiu (■-----■), and Bent (xxxx) for Equinox, Solar Cycle Maximum Conditions at 0500 LT. Profiles at the magnetic equator (top portion) and at 16° S dip latitude (bottom portion)

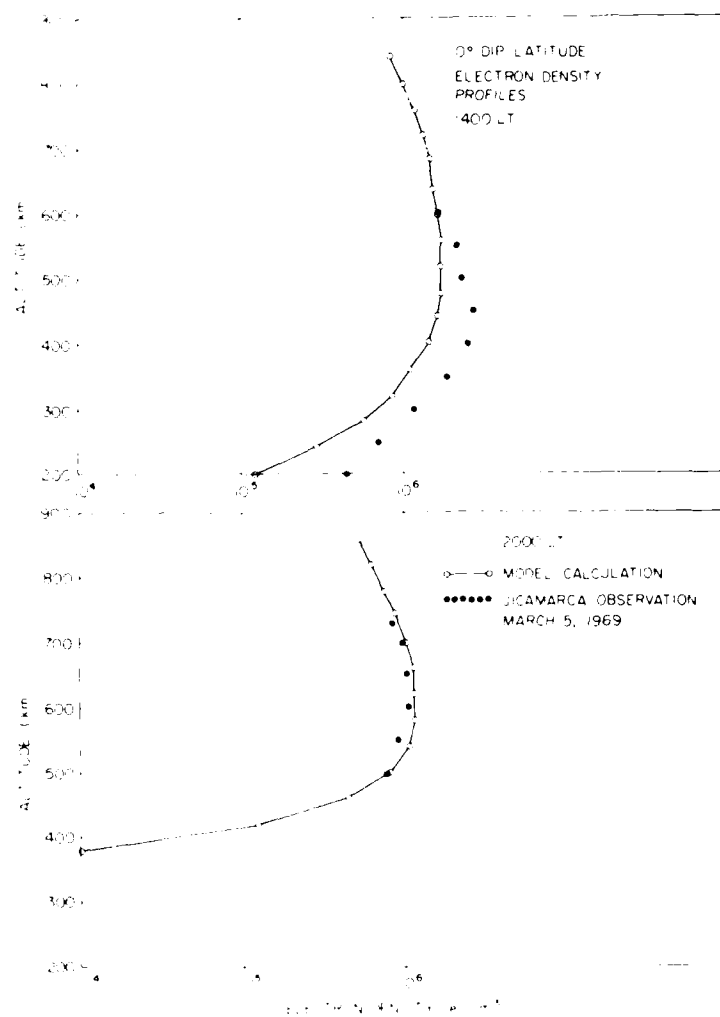


Figure 8. A Comparison Between SLIM-generated Electron Density Profiles (○—○) and Profiles Measured by the Jicamarca Incoherent Scatter Radar (●●●●) on 5 March 1969 at 1400 LT (top portion) and 2000 LT (bottom portion)

4. CONCLUSIONS

A very brief description of the generation of a Semi-empirical, Low-latitude, Ionospheric Model has been presented in which theoretically calculated electron density profiles are approximated by a Modified Chapman function given by Eq. (4).

$$N_e(h) = N_{\max} \exp [c(1 - z - e^{-z})] \quad (4)$$

where

$$z = \frac{h - h_{\max}}{A}$$

and $N_{\max}$ and $h_{\max}$ represent the peak electron density and the altitude of the F2 peak, respectively. Above the peak altitude, $z_{\text{up}} = \frac{h - h_{\max}}{A_{\text{up}}}$ and $c = c_{\text{up}}$ and below peak, $z_{\text{lo}} = \frac{h - h_{\max}}{A_{\text{lo}}}$ and $c = c_{\text{lo}}$. The six coefficients which describe each profile are $N_{\max}$, $h_{\max}$, A_{up} , c_{up} , A_{lo} and c_{lo} . Appropriate coefficients which regenerate electron density profiles (180-1800 km), every half-hour local time and every 2° dip latitude between 24° N and 24° dip latitude have been calculated. Six cases have been generated, both solstice periods and one equinox period for solar cycle minimum and solar maximum conditions.

A subroutine which is able to quickly generate realistic electron density profiles has a number of applications. By providing diurnal $N_e(h)$ and TEC values at any specified dip latitude or slant path, SLIM could be used to examine propagation effects determined by ionospheric structure. SLIM has several possible applications related to so-called "active experiments" where ambient ionospheric conditions need to be specified for pre-experiment planning and post-event analysis. In addition, such a model would yield flux-tube integrated Pedersen conductivity and electron content values which are important in determining and predicting low-latitude, instability growth rates. Finally, the program would be capable of supplying airglow intensities both in the vertical and at any slant viewing angle desired.

Table 2. Electron Density Profiles and Chapman Parameters

Each page of Table 2 provides the following values for a specified latitude, season and solar cycle:

1. Electron densities ($10^3/\text{cm}^3$) from 180 to 1800 km.
2. N_{max} ($10^3/\text{cm}^3$) and h_{max} (km).
3. The four Chapman parameters A_{up} (km), C_{up} , A_{lo} (km) and C_{lo} .
4. Total electron content - TEC ($10^{12}/\text{cm}^2$) and 630 nm O^+ recombination airglow (Rayleighs).

The above values are listed every hour local time and cover the latitude range from 24° N dip latitude (+24°) to 24° S dip latitude (-24°) in 4°-increments. The table is grouped by solar cycle (maximum and minimum) and within each solar cycle by season (Equinox, June Solstice and December Solstice). Remember that $C_{\text{up}} = 1000 * c_{\text{up}}$ and $C_{\text{lo}} = 1000 * c_{\text{lo}}$ where c_{up} and c_{lo} are defined by Eq. (3).

EQUINOX - SOLAR CYCLE MAXIMUM		ELECTRON DENSITY (10 ¹² /cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME																							
LATITUDE = -24 degrees		TEC - TOTAL ELECTRON CONTENT (10 ¹² /cm ²) 830 nm 0° RECOMBINATION AIRGLOW (rayleighs)																							
h _m	h _p	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1200	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1100	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
1000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
900	13	11	9	4	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	15	13	11	4	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	18	15	13	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	22	19	15	6	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	27	23	17	7	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	32	27	20	9	4	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
300	39	32	24	11	5	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
200	47	38	29	13	5	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
100	53	45	33	15	7	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
000	63	53	38	18	8	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
700	83	63	45	21	9	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
600	93	73	55	25	11	6	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
500	103	83	65	35	13	7	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
400	113	93	75	45	17	9	4	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
300	123	103	85	55	21	11	6	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
200	133	113	95	65	27	13	7	4	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
100	143	123	105	75	33	13	8	5	4	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
000	153	133	115	85	37	15	9	6	5	4	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1
700	163	143	125	95	41	17	10	7	6	5	4	3	2	1	1	1	1	1	1	1	1	1	1	1	1
600	173	153	135	105	45	19	11	8	7	6	5	4	3	2	1	1	1	1	1	1	1	1	1	1	1
500	183	163	145	115	49	21	12	9	8	7	6	5	4	3	2	1	1	1	1	1	1	1	1	1	1
400	193	173	155	125	53	23	13	10	9	8	7	6	5	4	3	2	1	1	1	1	1	1	1	1	1
300	203	183	165	135	57	25	14	11	10	9	8	7	6	5	4	3	2	1	1	1	1	1	1	1	1
200	213	193	175	145	61	27	15	12	11	10	9	8	7	6	5	4	3	2	1	1	1	1	1	1	1
100	223	203	185	155	65	29	16	13	12	11	10	9	8	7	6	5	4	3	2	1	1	1	1	1	1
000	233	213	195	165	69	31	17	14	13	12	11	10	9	8	7	6	5	4	3	2	1	1	1	1	1
700	243	223	205	175	73	33	18	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	1	1	1
600	253	233	215	185	77	35	19	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	1	1
500	263	243	225	195	81	37	20	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	1
400	273	253	235	205	85	39	21	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
300	283	263	245	215	89	41	22	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2
200	293	273	255	225	93	43	23	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3
100	303	283	265	235	97	45	24	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4
000	313	293	275	245	101	47	25	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5
700	323	303	285	255	105	49	26	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6
600	333	313	295	265	109	51	27	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7
500	343	323	305	275	113	53	28	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8
400	353	333	315	285	117	55	29	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9
300	363	343	325	295	121	57	30	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10
200	373	353	335	305	125	59	31	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11
100	383	363	345	315	129	61	32	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12
000	393	373	355	325	133	63	33	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13
700	403	383	365	335	137	65	34	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14
600	413	393	375	345	141	67	35	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15
500	423	403	385	355	145	69	36	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
400	433	413	395	365	149	71	37	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
300	443	423	405	375	153	73	38	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18
200	453	433	415	385	157	75	39	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19
100	463	443	425	395	161	77	40	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20
000	473	453	435	405	165	79	41	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21
700	483	463	445	415	169	81	42	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22
600	493	473	455	425	173	83	43	40	39	38	37	36	35	34	33	32	31								

EQUINOX - SOLAR CYCLE MAXIMUM
LATITUDE = -16 degrees

ELECTRON DENSITY (10¹²/cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME
TOTAL ELECTRON CONTENT (10¹²/cm²) 630 nm 0- RECOMBINATION AIRGLOW (rayleighs)

km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	LT
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

EQUINOX - SOLAR CYCLE MAXIMUM		LATITUDE = -12 degrees		TEC - TOTAL		ELECTRON DENSITY (10 ¹² /cm ²)		AS A FUNCTION OF HEIGHT (km)		630 nm		0° RECOMBINATION AIRGLOW (rayleighs)		LOCAL TIME												
h _{min}	h _{max}	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	LT
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1730	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1300	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
1200	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
1100	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
1000	33	20	13	6	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	39	24	16	7	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	47	28	19	8	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	55	34	22	9	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	65	40	26	11	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	78	48	31	13	5	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
400	93	57	36	16	6	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
300	110	68	43	19	7	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
200	131	81	50	22	9	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
100	155	96	59	26	11	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
0	185	115	70	31	13	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
800	185	115	70	31	13	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
700	219	137	82	37	15	5	2	3	4	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
600	260	163	97	44	19	6	3	4	5	13	27	42	57	72	87	102	117	132	147	162	177	192	207	222	237	252
500	309	194	115	52	22	7	4	5	7	16	35	54	73	92	111	130	149	168	187	206	225	244	263	282	301	320
400	367	232	136	62	27	9	5	7	11	26	61	96	131	166	201	236	271	306	341	376	411	446	481	516	551	586
300	436	276	160	74	32	11	6	9	15	33	80	121	159	197	235	273	311	349	387	425	463	501	539	577	615	653
200	518	329	189	88	38	13	7	11	26	61	96	131	159	197	235	273	311	349	387	425	463	501	539	577	615	653
100	615	392	223	104	46	16	9	15	33	80	121	159	197	235	273	311	349	387	425	463	501	539	577	615	653	691
0	730	467	263	124	55	19	12	19	42	104	231	359	487	615	743	871	999	1127	1255	1383	1511	1639	1767	1895	2023	2151
800	867	556	310	147	66	23	13	24	54	136	250	364	478	592	706	820	934	1048	1162	1276	1390	1504	1618	1732	1846	1960
700	1030	662	366	175	79	28	13	32	63	175	322	470	618	766	914	1062	1210	1358	1506	1654	1802	1950	2098	2246	2394	2542
600	1223	788	431	208	95	34	24	41	88	226	394	562	730	898	1066	1234	1402	1570	1738	1906	2074	2242	2410	2578	2746	2914
500	1452	937	509	246	113	41	30	53	112	288	476	664	852	1040	1228	1416	1604	1792	1980	2168	2356	2544	2732	2920	3108	3296
400	1724	1114	501	246	113	41	30	53	112	288	476	664	852	1040	1228	1416	1604	1792	1980	2168	2356	2544	2732	2920	3108	3296
300	2046	1322	709	348	162	50	38	68	142	365	599	833	1067	1301	1535	1769	2003	2237	2471	2705	2939	3173	3407	3641	3875	4109
200	2426	1566	836	413	194	73	61	115	230	570	910	1250	1590	1930	2270	2610	2950	3290	3630	3970	4310	4650	4990	5330	5670	6010
100	2868	1849	987	490	231	88	77	148	293	699	1285	2037	2834	3631	4428	5225	6022	6819	7616	8413	9210	10007	10804	11601	12398	13195
0	3367	2173	1164	582	275	106	97	192	373	844	1532	2282	3052	3822	4592	5362	6132	6902	7672	8442	9212	9982	10752	11522	12292	13062
800	3876	2536	1373	691	326	127	123	248	475	1003	1737	2443	3150	3857	4564	5271	5978	6685	7392	8099	8806	9513	10220	10927	11634	12341
700	4230	2930	1620	820	386	152	155	321	605	1169	2029	2843	3657	4471	5285	6099	6913	7727	8541	9355	10169	10983	11797	12611	13425	14239
600	4231	3332	1907	973	453	192	195	415	770	1330	2104	2857	3610	4363	5116	5869	6622	7375	8128	8881	9634	10387	11140	11893	12646	13399
500	4125	3700	2237	1150	527	215	243	537	976	1474	2048	2622	3196	3770	4344	4918	5492	6066	6640	7214	7788	8362	8936	9510	10084	10658
400	3878	3966	2587	1342	605	252	289	687	1207	1584	1914	2195	2476	2757	3038	3319	3600	3881	4162	4443	4724	5005	5286	5567	5848	6129
300	3430	4024	2862	1488	682	231	303	819	1309	1584	1769	1859	2011	2162	2313	2464	2615	2766	2917	3068	3219	3370	3521	3672	3823	3974
200	2735	3657	2847	1487	749	326	395	815	1275	1512	1448	1387	1474	1513	1557	1599	1643	1687	1731	1775	1819	1863	1907	1951	1995	2039
100	1830	2842	2582	1422	792	351	423	779	1182	1429	1156	1050	1099	1170	1241	1312	1383	1454	1525	1596	1667	1738	1809	1880	1951	2022
0	910	1808	2089	1271	777	352	423	779	1182	1429	1156	1050	1099	1170	1241	1312	1383	1454	1525	1596	1667	1738	1809	1880	1951	2022
800	214	890	1452	1002	573	277	352	779	1182	1429	1156	1050	1099	1170	1241	1312	1383	1454	1525	1596	1667	1738	1809	1880	1951	2022
700	35	316	825	628	266	148	180	354	509	594	376	311	289	231	392	259	159	68	22	6	0	0	0	0	0	0
600	1	74	358	258	62	44	22	154	257	165	215	174	154	110	239	134	74	22	6	0	0	0	0	0	0	0
500	0	108	49	5	6	2	34	89	50	109	88	73	52	135	62	28	5	1	0	0	0	0	0	0	0	0
400	0	1	20	2	0	0	0	2	17	10	49	39	31	21	71	26	9	1	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	4251	4039	2892	1498	799	357	304	823	1311	1645	2106	2458	2952	3483	3734	3915	3614	3415	3401	3311	3432	3969	4341	4230	4120	4010
700	415	345	333	289	287	347	347	337	335	333	485	433	441	435	483	467	449	437	459	540	505	453	419	385	351	317
600	20	49	17	15	56	46	16	10	11	132	23	30	35	65	24	35	215	215	205	194	97	138	282	215	150	85
500	172	430	141	129	508	438	188	129	133	1338	215	242														

EQUINOX - SOLAR CYCLE MAXIMUM		ELECTRON DENSITY (10 ¹² /cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME																							
LATITUDE = -4 degrees		630 nm O+ RECOMBINATION AIRGLOW (rayleighs)																							
TEC - TOTAL		0+ RECOMBINATION AIRGLOW (rayleighs)																							
km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1800	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1700	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1600	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1500	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1400	9	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1300	16	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1200	29	17	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1100	50	31	7	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1000	88	56	17	6	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
900	110	71	25	9	3	2	1	1	1	3	5	7	12	18	26	39	57	84	116	154	202	258	324	399	
800	123	80	29	11	4	2	1	1	1	4	11	18	28	43	64	94	131	181	244	324	424	544	684	844	
700	137	91	35	13	5	3	1	1	2	6	18	31	47	70	104	154	224	314	424	554	704	874	1064	1284	
600	154	102	41	15	6	3	1	1	2	7	23	40	61	91	134	194	274	374	494	634	794	974	1174	1394	
500	172	115	48	19	8	4	1	1	3	9	29	48	72	107	157	227	317	427	557	707	877	1067	1277	1507	
400	192	130	57	22	9	4	1	2	3	11	37	61	91	134	194	274	374	494	634	794	974	1174	1394	1624	
300	240	165	79	33	14	6	2	3	6	18	59	98	147	217	317	447	607	797	1017	1267	1547	1847	2167	2507	
200	268	186	93	39	17	8	3	4	7	22	75	120	174	244	344	474	634	824	1044	1294	1574	1874	2184	2514	
100	300	210	109	47	20	9	4	5	9	28	95	152	217	307	427	577	757	967	1207	1477	1777	2097	2437	2797	
0	334	236	128	57	25	11	5	6	12	36	120	206	296	406	536	696	886	1106	1356	1636	1946	2286	2656	3026	
700	373	266	150	68	30	14	7	8	15	45	152	242	332	432	542	662	792	932	1082	1242	1412	1592	1782	1982	
600	416	299	174	82	36	17	8	10	18	57	162	252	342	442	552	672	792	932	1082	1242	1412	1592	1782	1982	
500	464	337	203	95	44	20	10	13	25	73	242	364	486	608	730	852	974	1106	1248	1390	1532	1674	1816	1958	
400	517	379	235	117	54	24	13	17	32	92	364	486	608	730	852	974	1106	1248	1390	1532	1674	1816	1958	2099	
300	575	428	272	139	65	29	16	22	41	116	380	494	608	730	852	974	1106	1248	1390	1532	1674	1816	1958	2099	
200	640	478	313	165	79	35	20	28	53	147	414	528	642	756	870	984	1098	1212	1326	1440	1554	1668	1782	1896	
100	709	537	358	196	96	42	25	37	68	185	588	702	816	930	1044	1158	1272	1386	1500	1614	1728	1842	1956	2070	
0	786	602	409	230	116	51	32	47	88	234	725	839	953	1067	1181	1295	1409	1523	1637	1751	1865	1979	2093	2207	
700	869	673	465	270	139	61	34	50	77	145	375	489	603	717	831	945	1059	1173	1287	1401	1515	1629	1743	1857	
600	958	751	526	315	168	74	40	57	99	186	473	587	701	815	929	1043	1157	1271	1385	1499	1613	1727	1841	1955	
500	1053	837	591	366	201	89	63	99	186	473	587	701	815	929	1043	1157	1271	1385	1499	1613	1727	1841	1955	2069	
400	1154	929	660	421	239	108	78	128	239	599	1510	2345	2048	1922	1976	2048	2050	2021	1953	1383	1018	1348	1360	1360	
300	1259	1026	732	481	283	130	98	164	306	757	1745	2342	2023	1967	2017	2078	2076	2038	1958	1214	848	1338	1454	1461	
200	1366	1128	806	545	333	157	123	211	393	956	1910	2305	1990	1997	2047	2086	2075	2028	1929	1066	651	1302	1510	1557	
100	1473	1232	881	609	386	189	154	270	505	1298	2228	2137	1888	2003	2071	2066	2071	2048	1988	1855	771	448	1233	1550	
0	1577	1334	983	673	441	227	193	347	648	1520	2288	2137	1888	2003	2071	2066	2071	2048	1988	1855	771	448	1233	1550	
700	1672	1428	1021	733	495	273	240	448	832	1858	2317	2009	1816	1867	2045	1981	1902	1806	1569	317	128	969	1563	1772	
600	1753	1508	1082	784	543	323	296	572	1060	1951	2257	1856	1729	1890	1969	1860	1780	1661	1362	550	47	776	1510	1790	
500	1814	1565	1133	823	575	373	353	730	1347	1915	2118	1681	1623	1793	1843	1726	1625	1483	1126	59	12	569	1401	1790	
400	1847	1587	1171	844	585	397	379	897	1536	1831	1907	1491	1500	1652	1672	1562	1442	1278	879	16	2	348	1230	1721	
300	1837	1564	1193	842	572	391	371	928	1512	1695	1641	1294	1359	1478	1465	1371	1238	1065	640	3	0	176	1000	1574	
200	1723	1475	1188	808	532	369	347	896	1431	1502	1343	1095	1202	1277	1235	1100	1021	829	429	0	0	67	734	1337	
100	1470	1296	1057	718	457	328	300	820	1283	1258	1041	903	1032	1058	996	940	804	614	260	0	0	17	469	1021	
0	1085	1019	792	556	345	264	231	690	1062	980	759	723	855	834	766	722	599	424	140	0	0	3	247	667	
700	639	670	477	331	211	183	147	509	785	694	519	562	620	558	522	419	269	65	0	0	0	0	101	347	
600	266	331	217	121	92	100	69	305	492	434	329	422	510	430	383	350	271	154	26	0	0	0	29	129	
500	65	104	69	18	24	38	20	132	244	231	193	305	359	274	245	215	161	79	8	0	0	0	5	30	
400	7	16	14	0	3	8	3	34	86	100	104	213	233	158	146	119	86	35	2	0	0	0	3	0	
300	0	1	2	0	0	1	0	4	19	33	51	142	137	81	80	58	40	13	0	0	0	0	0	0	
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nmax	1851	1587	1197	846	585	397	379	932	1536	1955	2320	2350	2077	2011	2071	2086	2079	2038	1959	1880	1320	1348	1571	1801	
Hmax	351	359	327	351	363	361	361	361	361	409	425	515	587	455	441	483	491	497	505	615	609	519	433	393	
Apo	107	84	214	136	76	20	17	10	10	10	9	43	27	295	1062	182	132	153	154	114	134	113	144	113	
Cup	602	504	1934	1313	750	188	191	125	125	117	1125	379	207	2000	1438	961	629	750	703	625	797	629	832	625	
Alc	46	43	81	32	42	45	44	55	76	212	262	100	116	183	113	123	116	111	66	67	60	85	53		
C1o	250	129	2000	70	125	125	125	195	250	3750	1938	51	4384												

EQUINOX - SOLAR CYCLE MAXIMUM																								
LATITUDE = -0° degrees																								
TEC - TOTAL ELECTRON CONTENT (10 ¹⁶ cm ⁻²)																								
ELECTRON DENSITY (10 ¹⁰ cm ⁻³) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME																								
630 nm 0° RECOMBINATION AIRGLOW (rayleighs)																								
km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT
1800	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	9	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	16	8	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	28	15	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	48	28	11	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	84	53	23	7	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
980	94	59	27	8	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
960	104	67	31	10	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
940	117	76	36	12	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
920	130	86	42	14	3	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	145	97	48	17	4	2	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
880	162	110	56	21	5	3	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
860	181	124	64	25	6	3	2	4	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
840	201	140	74	30	8	4	2	6	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
820	224	158	86	35	11	5	3	8	12	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	250	178	99	44	14	6	4	5	16	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
780	278	201	114	52	18	8	4	6	22	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
760	310	226	131	62	23	9	6	8	30	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
740	345	254	156	74	29	12	7	10	40	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
720	383	285	173	88	36	15	9	12	53	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	425	320	198	105	46	18	11	16	71	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0
680	472	358	226	124	57	23	14	20	95	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0
660	522	400	259	145	70	28	18	26	125	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0
640	578	446	294	170	87	35	22	32	165	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
620	637	496	333	199	106	43	28	42	214	58	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	701	551	377	231	128	53	35	53	244	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0
580	770	609	425	267	153	65	44	68	321	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0
560	842	671	477	307	182	80	55	86	408	117	0	0	0	0	0	0	0	0	0	0	0	0	0	0
540	918	737	532	350	215	98	69	110	504	135	0	0	0	0	0	0	0	0	0	0	0	0	0	0
520	995	805	591	397	250	119	86	140	586	160	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	1073	875	652	446	288	144	108	179	671	185	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480	1149	944	713	496	327	173	134	227	779	217	0	0	0	0	0	0	0	0	0	0	0	0	0	0
460	1220	1013	714	547	368	206	166	289	879	242	0	0	0	0	0	0	0	0	0	0	0	0	0	0
440	1283	1077	832	595	407	241	204	368	979	269	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420	1334	1135	883	640	444	279	247	466	1087	295	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	1368	1183	926	677	478	317	295	586	1173	321	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	1368	1183	926	677	478	317	295	586	1173	321	0	0	0	0	0	0	0	0	0	0	0	0	0	0
360	1371	1237	970	723	523	378	386	885	1557	371	0	0	0	0	0	0	0	0	0	0	0	0	0	0
340	1338	1230	961	723	533	392	411	1023	1728	395	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	1261	1157	911	682	519	384	400	1073	1721	365	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	1109	995	798	580	441	332	331	972	1511	308	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	853	748	611	422	305	243	222	742	1151	915	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	505	456	371	242	158	145	117	465	745	568	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	180	202	152	96	55	66	45	233	399	306	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	24	55	31	22	11	21	12	90	172	139	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	7	2	2	1	4	2	26	58	52	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Mar	1379	1239	971	726	533	393	413	1075	1752	2260	2436	1913	1829	1963	1915	1935	1927	1898	1815	1521	1123	1105	1245	1392
Apr	391	351	365	347	333	333	333	333	331	361	457	549	495	459	371	477	461	483	503	613	611	521	437	389
May	113	146	144	181	296	51	52	29	34	36	26	34	322	456	306	183	152	163	165	145	206	195	224	196
Jun	595	914	1070	1773	4695	1008	598	32	422	438	262	3163	560	3398	2000	875	750	707	715	824	1375	1254	1471	1176
Jul	30	4	37	37	59	81	101	141	142	123	192	182	100	109	116	125	126	91	84	75	74	57	46	33
Aug	20	250	102	313	1004	1781	3750	7188	5750	2000	563	145	313	305	367	500	629	324	250	324	313	184	133	43
SEP	52	43	31	14	9	18	31	46	65	80	86	93	97	100	97	96	90	65	45	14	14	18	184	55
OCT	263	258	211	152	108	93	87	234	486	458	465	526	533	507	486	461	400	299	134	8	42	14	81	184

EQUINOX - SOLAR CYCLE MAXIMUM		ELECTRON DENSITY (10 ¹² /cm ²)		AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME		630 nm 0° RECOMBINATION AIRGLOW (rayleighs)	
LATITUDE = +4 degrees		TEC - TOTAL ELECTRON CONTENT (10 ¹² /cm ²)					
UT	UT	UT	UT	UT	UT	UT	UT
1900	1	0	0	0	0	0	0
1900	2	1	0	0	0	0	0
1900	3	2	0	0	0	0	0
1900	4	3	0	0	0	0	0
1900	5	4	0	0	0	0	0
1900	6	5	0	0	0	0	0
1900	7	6	0	0	0	0	0
1900	8	7	0	0	0	0	0
1900	9	8	0	0	0	0	0
1900	10	9	0	0	0	0	0
1900	11	10	0	0	0	0	0
1900	12	11	0	0	0	0	0
1900	13	12	0	0	0	0	0
1900	14	13	0	0	0	0	0
1900	15	14	0	0	0	0	0
1900	16	15	0	0	0	0	0
1900	17	16	0	0	0	0	0
1900	18	17	0	0	0	0	0
1900	19	18	0	0	0	0	0
1900	20	19	0	0	0	0	0
1900	21	20	0	0	0	0	0
1900	22	21	0	0	0	0	0
1900	23	22	0	0	0	0	0
1900	24	23	0	0	0	0	0
1900	25	24	0	0	0	0	0
1900	26	25	0	0	0	0	0
1900	27	26	0	0	0	0	0
1900	28	27	0	0	0	0	0
1900	29	28	0	0	0	0	0
1900	30	29	0	0	0	0	0
1900	31	30	0	0	0	0	0
1900	32	31	0	0	0	0	0
1900	33	32	0	0	0	0	0
1900	34	33	0	0	0	0	0
1900	35	34	0	0	0	0	0
1900	36	35	0	0	0	0	0
1900	37	36	0	0	0	0	0
1900	38	37	0	0	0	0	0
1900	39	38	0	0	0	0	0
1900	40	39	0	0	0	0	0
1900	41	40	0	0	0	0	0
1900	42	41	0	0	0	0	0
1900	43	42	0	0	0	0	0
1900	44	43	0	0	0	0	0
1900	45	44	0	0	0	0	0
1900	46	45	0	0	0	0	0
1900	47	46	0	0	0	0	0
1900	48	47	0	0	0	0	0
1900	49	48	0	0	0	0	0
1900	50	49	0	0	0	0	0
1900	51	50	0	0	0	0	0
1900	52	51	0	0	0	0	0
1900	53	52	0	0	0	0	0
1900	54	53	0	0	0	0	0
1900	55	54	0	0	0	0	0
1900	56	55	0	0	0	0	0
1900	57	56	0	0	0	0	0
1900	58	57	0	0	0	0	0
1900	59	58	0	0	0	0	0
1900	60	59	0	0	0	0	0
1900	61	60	0	0	0	0	0
1900	62	61	0	0	0	0	0
1900	63	62	0	0	0	0	0
1900	64	63	0	0	0	0	0
1900	65	64	0	0	0	0	0
1900	66	65	0	0	0	0	0
1900	67	66	0	0	0	0	0
1900	68	67	0	0	0	0	0
1900	69	68	0	0	0	0	0
1900	70	69	0	0	0	0	0
1900	71	70	0	0	0	0	0
1900	72	71	0	0	0	0	0
1900	73	72	0	0	0	0	0
1900	74	73	0	0	0	0	0
1900	75	74	0	0	0	0	0
1900	76	75	0	0	0	0	0
1900	77	76	0	0	0	0	0
1900	78	77	0	0	0	0	0
1900	79	78	0	0	0	0	0
1900	80	79	0	0	0	0	0
1900	81	80	0	0	0	0	0
1900	82	81	0	0	0	0	0
1900	83	82	0	0	0	0	0
1900	84	83	0	0	0	0	0
1900	85	84	0	0	0	0	0
1900	86	85	0	0	0	0	0
1900	87	86	0	0	0	0	0
1900	88	87	0	0	0	0	0
1900	89	88	0	0	0	0	0
1900	90	89	0	0	0	0	0
1900	91	90	0	0	0	0	0
1900	92	91	0	0	0	0	0
1900	93	92	0	0	0	0	0
1900	94	93	0	0	0	0	0
1900	95	94	0	0	0	0	0
1900	96	95	0	0	0	0	0
1900	97	96	0	0	0	0	0
1900	98	97	0	0	0	0	0
1900	99	98	0	0	0	0	0
1900	100	99	0	0	0	0	0
1900	101	100	0	0	0	0	0
1900	102	101	0	0	0	0	0
1900	103	102	0	0	0	0	0
1900	104	103	0	0	0	0	0
1900	105	104	0	0	0	0	0
1900	106	105	0	0	0	0	0
1900	107	106	0	0	0	0	0
1900	108	107	0	0	0	0	0
1900	109	108	0	0	0	0	0
1900	110	109	0	0	0	0	0
1900	111	110	0	0	0	0	0
1900	112	111	0	0	0	0	0
1900	113	112	0	0	0	0	0
1900	114	113	0	0	0	0	0
1900	115	114	0	0	0	0	0
1900	116	115	0	0	0	0	0
1900	117	116	0	0	0	0	0
1900	118	117	0	0	0	0	0
1900	119	118	0	0	0	0	0
1900	120	119	0	0	0	0	0
1900	121	120	0	0	0	0	0
1900	122	121	0	0	0	0	0
1900	123	122	0	0	0	0	0
1900	124	123	0	0	0	0	0
1900	125	124	0	0	0	0	0
1900	126	125	0	0	0	0	0
1900	127	126	0	0	0	0	0
1900	128	127	0	0	0	0	0
1900	129	128	0	0	0	0	0
1900	130	129	0	0	0	0	0
1900	131	130	0	0	0	0	0
1900	132	131	0	0	0	0	0
1900	133	132	0	0	0	0	0
1900	134	133	0	0	0	0	0
1900	135	134	0	0	0	0	0
1900	136	135	0	0	0	0	0
1900	137	136	0	0	0	0	0
1900	138	137	0	0	0	0	0
1900	139	138	0	0	0	0	0
1900	140	139	0	0	0	0	0
1900	141	140	0	0	0	0	0
1900	142	141	0	0	0	0	0
1900	143	142	0	0	0	0	0
1900	144	143	0	0	0	0	0
1900	145	144	0	0	0	0	0
1900	146	145	0	0	0	0	0
1900	147	146	0	0	0	0	0
1900	148	147	0	0	0	0	0
1900	149	148	0	0	0	0	0
1900	150	149	0	0	0	0	0
1900	151	150	0	0	0	0	0
1900	152	151	0	0	0	0	0
1900	153	152	0	0	0	0	0
1900	154	153	0	0	0	0	0
1900	155	154	0	0	0	0	0
1900	156	155	0	0	0	0	0
1900	157	156	0	0	0	0	0
1900	158	157	0	0	0	0	0
1900	159	158	0	0	0	0	0
1900	160	159	0	0	0	0	0
1900	161	160	0	0	0	0	0
1900	162	161	0	0	0	0	0
1900	163	162	0	0	0	0	0
1900	164	163	0	0	0	0	0
1900	165	164	0	0	0	0	0
1900	166	165	0	0	0	0	0
1900	167	166	0	0	0	0	0
1900	168	167	0	0	0	0	0
1900	169	168	0	0	0	0	0
1900	170	169	0	0	0	0	0
1900	171	170	0	0	0	0	0
1900	172	171	0	0	0	0	0
1900	173	172	0	0	0	0	0
1900	174	173	0	0	0	0	0
1900	175	174	0	0	0	0	0
1900	176	175	0	0	0	0	0
1900	177	176	0	0	0	0	0
1900	178	177	0	0	0	0	0
1900	179	178	0	0	0	0	0
1900	180	179	0	0	0	0	0
1900	181	180	0	0	0	0	0
1900	182	181	0	0	0	0	0
1900	183	182	0	0	0	0	0
1900	184	183	0	0	0	0	0
1900	185	184	0	0	0	0	0
1900	186	185	0	0	0	0	0
1900	187	186	0	0	0	0	0
1900	188	187	0	0	0	0	0
1900	189	188	0	0	0	0	0
1900	190	189	0	0	0	0	0
1900	191	190	0	0	0	0	0
1900	192	191	0	0	0	0	0
1900	193	192	0	0	0	0	0
1900	194	193	0	0	0	0	0
1900	195	194	0	0	0	0	0
1900	196	195	0	0	0	0	0
1900	197	196	0	0	0	0	0
1900	198	197	0	0	0	0	0
1900	199	198	0	0	0	0	0
1900	200	199	0	0	0	0	0
1900	201	200					

EQUINOX - SOLAR CYCLE MAXIMUM		ELECTRON DENSITY (10 ¹² /cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME																							
LATITUDE = +8 degrees		630 nm 0+ RECOMBINATION AIRGLOW (rayleighs)																							
km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	LT
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	11	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	21	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	40	14	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	77	32	5	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	100	38	6	4	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	144	52	11	6	5	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
700	129	61	13	7	6	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
600	147	71	17	9	7	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
500	168	84	22	11	8	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
400	191	98	28	14	10	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
300	217	115	35	17	12	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
200	247	135	44	21	14	5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
100	280	158	56	26	17	6	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
0	300	182	159	70	32	20	8	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
0	321	185	70	32	20	8	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
0	365	216	87	40	24	9	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
0	418	253	108	50	28	11	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
0	476	295	134	61	34	13	7	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
0	538	345	165	75	40	16	8	11	21	53	153	432	81	1061	1310	1336	1328	1368	1441	1712	1433	991	829	719	636
0	600	412	202	93	48	19	10	14	27	68	192	578	958	1224	1456	1455	1445	1451	1561	1660	1660	1107	931	812	688
0	686	612	402	202	93	48	19	10	14	27	68	192	578	958	1224	1456	1455	1445	1451	1561	1660	1660	1107	931	812
0	760	696	468	246	114	58	23	18	35	87	243	680	1117	1409	1584	1575	1585	1617	1684	1682	1685	1234	943	816	688
0	840	791	544	298	139	69	28	16	23	45	111	306	800	1295	1617	1722	1697	1716	1745	1806	2083	1798	1369	1165	1032
0	928	898	632	359	169	83	34	20	30	58	142	385	940	1498	1844	1856	1819	1847	1873	1926	2149	1890	1512	1299	1161
0	1019	732	429	206	99	40	25	38	74	182	485	1195	1696	2084	1984	1939	1974	1996	2041	2165	2494	2165	1496	1595	1458
0	1155	845	510	249	118	48	32	49	96	233	611	1296	1909	2315	2102	2053	2094	2112	2146	2144	1952	1865	1595	1458	1458
0	1307	973	601	300	141	58	39	64	123	298	768	1518	2118	2501	2208	2160	2205	2217	2237	2090	1992	1942	1754	1626	1626
0	1476	1116	703	359	169	70	49	82	159	381	962	1757	2309	2576	2298	2256	2301	2307	2311	1993	1853	2059	1941	1806	1806
0	1661	1273	814	427	202	84	61	106	264	487	1199	2034	2567	2369	2338	2379	2376	2362	1847	1737	2141	2081	1995	1995	1995
0	1861	1444	934	504	241	101	76	136	263	620	1474	2283	2559	2540	2402	2403	2435	2402	2385	1647	1571	2170	2237	2189	2189
0	2074	1627	1061	590	287	122	95	175	337	786	1764	2428	2575	2493	2448	2448	2485	2441	2365	1395	1354	2155	2380	2380	2380
0	2293	1817	1193	684	343	146	118	225	432	988	1995	2414	2535	2424	2451	2470	2464	2401	2269	1101	1096	1096	2104	2499	2568
0	2509	2007	1325	784	407	176	146	289	552	1227	2037	2349	2445	2330	2310	2319	2386	2294	2151	1854	796	816	2005	2562	2733
0	2706	2190	1453	887	482	211	179	370	700	1488	2002	2235	2309	2210	2319	2386	2294	2151	1854	796	816	2005	2562	2733	2733
0	2862	2354	1572	988	566	254	217	470	877	1713	1974	2172	2172	2172	2172	2172	2172	2172	2172	2172	2172	2172	2172	2172	2172
0	2948	2484	1676	1081	656	305	258	590	1078	1882	1813	1872	1872	1872	1872	1872	1872	1872	1872	1872	1872	1872	1872	1872	1872
0	3036	2593	1760	1160	741	363	298	724	1280	1960	1658	1640	1684	1696	1671	1699	1630	1406	933	39	15	15	15	15	15
0	3215	2871	1917	1215	802	420	325	851	1426	1730	1470	1389	1437	1487	1526	1530	1358	1120	651	1	1	1	1	1	1
0	3444	3157	2115	1315	806	436	337	924	1467	1595	1257	1184	1189	1263	1268	1237	1076	848	419	1	1	1	1	1	1
0	3692	3451	2315	1515	974	574	465	705	1658	904	805	685	933	1037	1013	951	810	606	246	0	0	0	0	0	0
0	3962	3751	2515	1715	1068	668	559	828	1722	1705	1406	1216	1106	1106	1106	1106	1106	1106	1106	1106	1106	1106	1106	1106	1106
0	4248	4037	2715	1915	1168	758	649	941	1944	1719	144	126	126	126	126	126	126	126	126	126	126	126	126	126	126
0	4534	4323	2915	2115	1268	848	739	829	1944	1719	144	126	126	126	126	126	126	126	126	126	126	126	126	126	126
0	4820	4609	3115	2315	1368	938	829	829	1944	1719	144	126	126	126	126	126	126	126	126	126	126	126	126	126	126
0	5106	4895	3315	2515	1468	1028	919	919	1944	1719	144	126	126	126	126	126	126	126	126	126	126	126	126	126	126
0	5392	5181	3515	2715	1568	1118	1009	1009	1944	1719	144	126	126	126	126	126	126	126	126	126	126	126	126	126	126
0	5678	5467	3715	2915	1668	1208	1099	1099	1944	1719	144	126	126	126	126	126	126	126	126	126	126	126	126	126	126
0	5964	5753	3915	3115	1768	1298	1189	1189	1944	1719	144	126	126	126	126	126	126	126	126	126	126	126	126	126	126
0	6250	6039	4115	3315	1868	1388	1279	1279	1944	1719	144	126	126	126	126	126	126	126	126	126	126	126	126	126	126
0	6536	6325	4315	3515	1968	1478	1369	1369	1944	1719	144	126	126	126	126	126	126	126	126	126	126	126	126	126	126
0	6822	6611	451																						

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EQUINOX - SOLAR CYCLE MAXIMUM
 ALTITUDE - 30 degrees ELECTRON DENSITY - 10¹² m⁻³ AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME
 AIR FORCE - 30 degrees ELECTRON DENSITY - 10¹² m⁻³ AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME

1900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

EQUINOX - SOLAR CYCLE MAXIMUM LATITUDE = +24 degrees		ELECTRON DENSITY (10 ¹² /cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME TEC - TOTAL ELECTRON CONTENT (10 ¹² /cm ²) 630 nm 0° RECOMBINATION AIRGLOW (rayleighs)																						
km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	4	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	10	11	7	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	12	13	8	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	15	15	9	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	18	17	11	6	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	21	21	13	7	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	26	24	15	8	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	31	28	18	9	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	37	33	21	11	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	45	39	25	13	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	54	46	29	15	5	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00	65	54	34	18	6	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	78	64	40	21	7	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	93	75	48	25	9	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	112	88	56	30	11	5	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	134	103	66	36	13	6	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	160	121	78	42	16	8	5	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	191	142	91	50	19	8	6	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	228	167	108	59	23	10	8	5	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
00	271	196	127	70	28	12	9	10	20	57	110	213	325	440	513	544	458	427	411	591	508	396	349	297
600	321	230	149	82	34	14	11	14	26	70	164	252	379	510	586	618	589	553	548	777	679	541	476	411
500	379	270	176	98	41	16	14	18	35	86	162	298	442	590	669	703	687	630	631	887	785	632	556	483
400	445	317	207	115	49	22	17	24	45	106	197	353	516	681	764	799	758	717	726	1010	906	736	649	565
300	520	371	243	137	59	29	20	32	59	130	238	417	601	785	872	909	859	816	833	1145	1046	854	756	659
200	604	434	286	161	72	26	24	43	77	160	289	493	701	903	996	1033	974	928	962	1291	1204	987	878	764
100	788	587	396	226	103	37	36	74	129	242	424	689	948	1306	1338	1174	1105	1055	1084	1447	1303	1134	1016	878
00	884	677	466	267	124	43	43	96	166	287	512	812	1098	1342	1484	1518	1421	1362	1381	1767	1580	1292	1166	999
400	1050	868	638	371	176	60	63	160	271	447	740	1116	1449	1685	1931	1957	1823	1741	1703	2046	2156	1762	1534	1300
300	1122	1004	826	507	243	83	92	254	423	669	1035	1472	1808	1995	2283	2420	2266	2152	1990	2174	2178	1905	1415	1247
200	1048	997	868	584	282	97	110	313	517	809	1192	1622	1926	2096	2233	2442	2448	2315	2088	2088	2036	1813	1227	1055
100	843	896	847	658	322	113	130	376	618	991	1328	1685	1936	2125	2112	2337	2421	2371	2133	1814	1781	1555	968	779
00	560	709	782	711	361	130	141	441	719	1092	1399	1635	1835	2018	1917	2129	2255	2258	2040	1404	1419	1172	674	487
300	292	480	666	715	394	147	135	500	807	1133	1366	1491	1627	1756	1657	1832	1961	1969	1594	950	933	752	400	246
200	111	267	507	650	415	160	118	544	865	1079	1236	1263	1335	1386	1350	1476	1574	1544	1173	549	578	394	193	96
100	28	116	328	514	408	161	92	562	868	949	1022	983	999	1025	1100	1148	1064	944	264	260	161	771	27	27
00	4	37	189	334	312	135	63	494	748	757	690	671	612	714	750	749	626	263	102	82	48	18	5	5
300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nmax	1123	1011	868	721	418	163	141	562	877	1135	1401	1685	1947	2127	2285	2457	2458	2373	2134	2174	2223	1905	1538	1325
Hmax	401	391	381	329	289	287	341	279	287	325	337	361	369	363	405	391	375	363	357	399	421	401	435	423
Aup	93	46	23	33	66	31	14	92	78	25	40	33	39	67	10	14	18	32	84	86	36	65	35	60
Cup	863	371	188	277	625	254	133	1359	1066	258	387	277	301	500	66	90	113	207	625	625	262	523	273	504
Alo	81	91	57	58	91	91	89	51	71	78	111	122	122	171	109	131	121	102	82	131	59	62	77	91
Clo	1875	1855	313	703	5188	3813	1398	1625	1930	779	2000	1938	1938	5563	801	1622	1867	1813	1938	3688	285	1750	680	1734
TEC	27	24	20	16	8	3	3	10	16	23	31	41	50	58	64	88	66	63	56	61	59	48	38	32
630	49	76	137	202	166	80	48	271	470	550	575	560	560	547	614	659	662	584	387	227	198	137	73	47

EQUINOX - SOLAR CYCLE MINIMUM																								ELECTRON DENSITY (10 ³ /cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME																								630 nm Q ₁ RECOMBINATION AIRPOLOCA MAY 1956																																															
LATITUDE = -16 degrees																								TEC - TOTAL ELECTRON CONTENT																								10 ¹² /cm ²																								23 LT																							
km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT																																																																							
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																							
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																							
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																							
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																							
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																							
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																							
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																							
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																							
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																							
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																							
800	1	0	0	0	0	0	0	0	0	0	1	1	2	3	4	5	6	7	1	1	2	1	1	1																																																																							
700	1	0	0	0	0	0	0	0	0	0	1	1	3	4	5	6	7	4	1	1	3	1	1	1																																																																							
600	1	0	0	0	0	0	0	0	0	0	1	1	4	5	6	7	6	4	1	1	3	1	1	1																																																																							
500	2	0	0	0	0	0	0	0	0	0	1	1	5	7	9	9	7	6	2	1	3	1	1	2																																																																							
400	2	0	0	0	0	0	0	0	0	0	1	2	7	9	9	9	7	7	3	4	5	1	1	2																																																																							
300	2	1	0	0	0	0	0	0	0	0	1	3	8	12	11	11	9	7	4	5	7	4	4	3																																																																							
200	3	1	1	0	0	0	0	0	0	0	1	4	11	15	14	13	10	6	9	12	6	7	6	4																																																																							
100	4	1	1	0	0	0	0	0	0	0	1	5	13	16	14	12	8	6	9	15	7	8	5	4																																																																							
0	5	2	2	1	0	0	0	0	0	0	1	6	17	24	29	23	16	11	12	15	10	12	10	5																																																																							
381	6	2	2	1	0	0	0	0	0	0	2	8	17	24	29	23	16	11	12	15	10	12	10	5																																																																							
319	8	3	3	1	0	0	0	0	0	0	3	10	21	30	37	32	25	18	15	16	13	13	13	7																																																																							
19	10	5	3	1	0	0	0	0	0	0	4	13	26	37	46	42	32	22	22	24	17	19	17	9																																																																							
227	13	6	4	1	0	0	0	0	0	0	5	18	33	47	58	53	41	30	29	30	23	23	23	13																																																																							
91	16	8	5	2	0	0	0	0	0	0	6	23	42	59	73	68	52	41	39	39	33	35	22	13																																																																							
3563	20	11	7	3	1	0	0	0	0	0	7	30	53	74	92	93	87	74	69	62	49	31	25	17																																																																							
6	25	14	9	4	1	0	0	0	0	0	8	38	66	94	115	118	101	85	74	69	54	41	35	24																																																																							
5	27	15	9	5	2	0	0	0	0	0	9	46	80	111	145	149	141	128	108	98	79	66	57	43																																																																							
4	29	17	11	6	3	1	0	0	0	0	10	52	83	118	145	149	141	128	108	98	79	66	57	43																																																																							
3	31	18	12	7	4	1	0	0	0	0	11	58	95	132	160	163	158	138	129	119	101	91	83	77																																																																							
2	33	20	14	8	5	2	0	0	0	0	12	64	106	147	178	180	176	168	158	148	128	124	106	91																																																																							
1	35	22	16	9	6	3	1	0	0	0	13	70	117	160	193	200	195	186	176	166	156	146	128	113																																																																							
0	37	24	18	10	7	4	2	0	0	0	14	76	128	173	208	216	215	205	195	185	175	165	148	133																																																																							
381	39	26	20	11	8	5	3	1	0	0	15	82	139	186	223	232	230	220	210	200	190	180	163	148																																																																							
319	41	28	22	12	9	6	4	2	0	0	16	88	147	196	236	246	245	235	225	215	205	195	178	163																																																																							
19	43	30	24	13	10	7	5	3	1	0	17	94	154	205	247	258	257	247	237	227	217	207	190	175																																																																							
227	45	32	26	14	11	8	6	4	2	0	18	100	162	214	258	269	268	258	248	238	228	218	201	186																																																																							
91	47	34	28	15	12	9	7	5	3	1	19	106	168	221	266	278	277	267	257	247	237	227	210	195																																																																							
3563	49	36	30	16	13	10	8	6	4	2	20	112	172	226	272	284	283	273	263	253	243	226	211	206																																																																							
6	51	38	32	17	14	11	9	7	5	3	21	118	178	233	280	292	291	281	271	261	251	234	219	214																																																																							
5	53	40	34	18	15	12	10	8	6	4	22	124	184	239	286	300	299	289	279	269	259	242	227	222																																																																							
4	55	42	36	19	16	13	11	9	7	5	23	130	190	245	293	308	307	297	287	277	267	250	235	230																																																																							
3	57	44	38	20	17	14	12	10	8	6	24	136	196	251	299	314	313	303	293	283	273	256	241	236																																																																							
2	59	46	40	21	18	15	13	11	9	7	25	142	202	257	306	321	320	310	300	290	280	263	247	242																																																																							
1	61	48	42	22	19	16	14	12	10	8	26	148	208	263	312	327	326	316	306	296	286	269	253	248																																																																							
381	63	50	44	23	20	17	15	13	11	9	27	154	214	269	318	333	332	322	312	302	292	275	259	254																																																																							
319	65	52	46	24	21	18	16	14	12	10	28	160	220	275	324	339	338	328	318	308	298	281	265	260																																																																							
19	67	54	48	25	22	19	17	15	13	11	29	166	226	281	330	345	344	334	324	314	304	287	271	266																																																																							
227	69	56	50	26	23	20	18	16	14	12	30	172	232	287	336	351	350	340	330	320	310	293	277	272																																																																							
91	71	58	52	27	24	21	19	17	15	13	31	178	238	293	342	357	356	346	336	326	316	299	283	278																																																																							
3563	73	60	54	28	25	22	20	18	16	14	32	184	244	299	348	363	362	352	342	332	322	305	289	284																																																																							
6	75	62	56	29	26	23	21	19	17	15	33	190	250	305	354	369	368	358	348	338	328	311	295	290																																																																							
5	77	64	58	30	27	24	22	20	18	16	34	196	256	311	360	375	374	364	354	344	334	317	301	296																																																																							
4	79	66	60	31	28	25	23	21	19	17	35	202	262	317	366	381	380	370	360	350	340	323	307	302																																																																							
3	81	68	62	32	29	26	24	22	20	18	36	208	268	323	372	387	386	376	366	356	346	329	313	308																																																																							
2	83	70	64	33	30	27	25	23	21	19	37	214	274	329	378	393	392	382	372	362	352	335	319	314																																																																							
1	85	72	66	34	31	28	26	24	22	20	38	220	280	335	384	399	398	388	378	368	358	341	325	320																																																																							
381	87	74	68	35	32	29	27	25	23	21	39	226	286	341	390	405	404	394	384	374	364	347	331	326																																																																							
319	89	76	70	36	33	30	28	26	24	22	40	232	292	347	396	411	410	400	390	380	370	353	337	332																																																																							
19	91	78	72	37	34	31	29	27	25	23	41	238	298	353	402	417	416	406	396	386	376	359	343	338																																																																							
227	93	80	74	38	35	32	30	28	26	24	42	244	304	359	408	423	422	412	402	392	382	365	349	344																																																																							
91	95	82	76	39	36	33	31	29	27	25	43	250	310	365	414	429	428	418	408	398	388	371	355	350																																																																							
3563	97	84	78	40	37	34	32	30	28	26	44	256	316	371	420	435	434	424	414	404	394	377	361	356																																																																							
6	99	86	80	41	38	35	33	31	29	27	45	262	322	377	426	441	440	430	420	410	400	383	367	362																																																																							
5	101	88	82	42	39	36	34	32	30	28	46	268	328	383	432	447	446	436	426	416	406	389	373	368																																																																							
4	103	90	84	43	40	37	35	33	31	29	47	274	334	389	438	453	452	442	432	422	412	395	379	374																																																																							
3	105	92	86	44	41	38	36	34	32	30	48	280	340	395	444	459	458	448	438	428	418	401	385	380																																																																							
2	107	94	88	45	42	39	37	35	33	31	49	286	346	401	450	465	464	454	444	434	424	407	391	386																																																																							
1	109	96	90	46	43	40	38	36	34	32	50	292	352																																																																																		

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EQUINOX - SOLAR CYCLE MINIMUM																								ELECTRON DENSITY (10 ¹² /cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME																							
LATITUDE = +0 degrees																								TEC - TOTAL ELECTRON CONTENT (10 ¹² /cm ²)																							
km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT																							
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
1000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
900	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
800	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
700	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
600	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
500	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
400	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
300	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
200	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
100	6	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
0	7	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
700	9	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
600	10	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
500	12	6	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
400	15	8	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
300	18	10	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
200	21	12	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
100	26	15	9	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
0	31	18	11	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
700	37	22	13	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
600	45	27	16	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
500	54	33	20	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
400	64	41	24	9	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
300	77	50	29	11	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
200	93	61	35	14	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
100	112	75	43	18	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
0	134	92	52	23	9	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
700	161	112	63	29	12	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
600	193	135	77	37	17	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
500	232	162	93	47	22	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
400	276	194	113	59	30	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
300	328	229	136	74	39	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
200	386	266	163	92	50	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
100	446	303	193	111	63	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
0	500	336	220	128	74	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
700	529	358	234	138	80	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
600	590	390	260	150	90	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
500	639	430	290	170	100	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
400	690	480	340	200	110	55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
300	740	530	390	250	120	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
200	790	580	440	300	130	65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
100	840	630	490	350	140	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
0	890	680	540	400	150	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
700	940	730	590	450	160	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
600	990	780	640	500	170	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
500	1040	830	690	550	180	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
400	1090	880	740	600	190	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
300	1140	930	790	650	200	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
200	1190	980	840	700	210	105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
100	1240	1030	890	750	220	110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
0	1290	1080	940	800	230	115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
700	1340	1130	990	850	240	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
600	1390	1180	1040	900	250	125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
500	1440	1230	1090	950	260	130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
400	1490	1280	1140	1000	270	135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
300	1540	1330	1190	1050	280	140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
200	1590	1380	1240	1100	290	145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
100	1640	1430	1290	1150	300	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
0	1690	1480	1340	1200	310	155	0	0	0																																						

EQUINOX - SOLAR CYCLE MINIMUM		ELECTRON DENSITY ($10^{12}/\text{cm}^2$)										AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME													
LATITUDE = +8 degrees		TEC - TOTAL ELECTRON CONTENT ($10^{12}/\text{cm}^2$)										630 nm 0- RECOMBINATION AIRFLOW (rayleighs)													
km	UT	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[illegible]

FIGURE 1. SOLAR FLUX, WIND VELOCITY, ELECTRON DENSITY, $(10^{-13}/\text{cm}^3)$ AS A FUNCTION OF HEIGHT, TIME, AND LOCAL TIME
 ALTITUDE = 100 degrees
 TOTAL ELECTRON CONTENT $(10^{12}/\text{cm}^2)$ 530 nm C-RECOMBINATION AIRPLANE DAY AIR-GE

TIME	SOLAR FLUX	WIND VELOCITY	ELECTRON DENSITY	TEC	530 nm C-RECOMBINATION	AIRPLANE DAY	AIR-GE
1000	100	10	10	10	10	10	10
1100	100	10	10	10	10	10	10
1200	100	10	10	10	10	10	10
1300	100	10	10	10	10	10	10
1400	100	10	10	10	10	10	10
1500	100	10	10	10	10	10	10
1600	100	10	10	10	10	10	10
1700	100	10	10	10	10	10	10
1800	100	10	10	10	10	10	10
1900	100	10	10	10	10	10	10
2000	100	10	10	10	10	10	10
2100	100	10	10	10	10	10	10
2200	100	10	10	10	10	10	10
2300	100	10	10	10	10	10	10
2400	100	10	10	10	10	10	10
2500	100	10	10	10	10	10	10
2600	100	10	10	10	10	10	10
2700	100	10	10	10	10	10	10
2800	100	10	10	10	10	10	10
2900	100	10	10	10	10	10	10
3000	100	10	10	10	10	10	10
3100	100	10	10	10	10	10	10
3200	100	10	10	10	10	10	10
3300	100	10	10	10	10	10	10
3400	100	10	10	10	10	10	10
3500	100	10	10	10	10	10	10
3600	100	10	10	10	10	10	10
3700	100	10	10	10	10	10	10
3800	100	10	10	10	10	10	10
3900	100	10	10	10	10	10	10
4000	100	10	10	10	10	10	10
4100	100	10	10	10	10	10	10
4200	100	10	10	10	10	10	10
4300	100	10	10	10	10	10	10
4400	100	10	10	10	10	10	10
4500	100	10	10	10	10	10	10
4600	100	10	10	10	10	10	10
4700	100	10	10	10	10	10	10
4800	100	10	10	10	10	10	10
4900	100	10	10	10	10	10	10
5000	100	10	10	10	10	10	10
5100	100	10	10	10	10	10	10
5200	100	10	10	10	10	10	10
5300	100	10	10	10	10	10	10
5400	100	10	10	10	10	10	10
5500	100	10	10	10	10	10	10
5600	100	10	10	10	10	10	10
5700	100	10	10	10	10	10	10
5800	100	10	10	10	10	10	10
5900	100	10	10	10	10	10	10
6000	100	10	10	10	10	10	10
6100	100	10	10	10	10	10	10
6200	100	10	10	10	10	10	10
6300	100	10	10	10	10	10	10
6400	100	10	10	10	10	10	10
6500	100	10	10	10	10	10	10
6600	100	10	10	10	10	10	10
6700	100	10	10	10	10	10	10
6800	100	10	10	10	10	10	10
6900	100	10	10	10	10	10	10
7000	100	10	10	10	10	10	10
7100	100	10	10	10	10	10	10
7200	100	10	10	10	10	10	10
7300	100	10	10	10	10	10	10
7400	100	10	10	10	10	10	10
7500	100	10	10	10	10	10	10
7600	100	10	10	10	10	10	10
7700	100	10	10	10	10	10	10
7800	100	10	10	10	10	10	10
7900	100	10	10	10	10	10	10
8000	100	10	10	10	10	10	10
8100	100	10	10	10	10	10	10
8200	100	10	10	10	10	10	10
8300	100	10	10	10	10	10	10
8400	100	10	10	10	10	10	10
8500	100	10	10	10	10	10	10
8600	100	10	10	10	10	10	10
8700	100	10	10	10	10	10	10
8800	100	10	10	10	10	10	10
8900	100	10	10	10	10	10	10
9000	100	10	10	10	10	10	10
9100	100	10	10	10	10	10	10
9200	100	10	10	10	10	10	10
9300	100	10	10	10	10	10	10
9400	100	10	10	10	10	10	10
9500	100	10	10	10	10	10	10
9600	100	10	10	10	10	10	10
9700	100	10	10	10	10	10	10
9800	100	10	10	10	10	10	10
9900	100	10	10	10	10	10	10
10000	100	10	10	10	10	10	10

JUNE SOLSTICE - SOLAR CYCLE MAXIMUM										ELECTRON DENSITY (10**3/cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME																			
LATITUDE = -24 degrees										630 nm O+ RECOMBINATION AIRGLOW (rayleighs)																			
TEC - TOTAL ELECTRON CONTENT										0+																			
km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	LT				
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Nmax	188	171	139	102	43	14	10	290	625	807	925	1098	1248	1356	1404	1381	1223	1143	977	916	642	450	314	237					
Hmax	357	349	347	298	261	284	375	290	267	261	311	318	325	330	331	323	345	322	361	338	349	345	381	369					
Aup	149	66	16	22	67	27	112	37	46	80	16	24	32	24	24	31	12	41	19	55	27	61	35	101					
Cup	1092	695	152	215	762	313	1480	438	508	879	137	191	250	164	152	188	70	250	117	426	223	578	320	1137					
Alo	91	101	33	81	41	43	141	101	91	51	34	57	78	87	88	101	43	100	62	69	45	81	68	71					
Clo	3688	3375	66	1848	1500	313	1590	3551	5125	1688	66	313	691	875	1651	78	1955	233	770	191	1852	570	1658	1688					
TEC	4	4	3	2	1	0	0	0	5	11	15	20	26	31	35	38	35	32	27	23	15	10	7	5					
630	20	28	41	49	23	9	4	165	394	520	590	633	656	674	695	695	641	540	381	330	202	95	40	22					

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JUNE SOLSTICE - SOLAR CYCLE MAXIMUM ELECTRON DENSITY ($10^{23}/\text{cc}$) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME
 LATITUDE = -12 degrees TEC - TOTAL ELECTRON CONTENT ($10^{12}/\text{cm}^2$) 630 nm 0° RECOMBINATION AIRGLOW (ray) gms

km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	2	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	5	6	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	6	7	5	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	7	8	6	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	8	9	7	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	10	11	8	4	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	12	13	9	4	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	15	15	10	5	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	18	18	12	6	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	22	21	14	7	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	27	25	16	8	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	33	29	19	9	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	34	22	11	5	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	40	34	22	11	5	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
0	48	40	26	12	6	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
0	59	47	30	14	7	4	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0
0	71	55	34	17	8	4	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0
0	86	65	40	19	9	5	4	3	2	1	0	0	0	0	0	0	0	0	0	0	0
0	105	76	46	22	11	6	5	4	3	2	1	0	0	0	0	0	0	0	0	0	0
0	126	90	54	26	13	7	6	5	4	3	2	1	0	0	0	0	0	0	0	0	0
0	152	105	63	30	15	8	7	6	5	4	3	2	1	0	0	0	0	0	0	0	0
0	184	124	73	35	17	9	11	10	9	8	7	6	5	4	3	2	1	0	0	0	0
0	221	145	84	41	20	11	13	12	11	10	9	8	7	6	5	4	3	2	1	0	0
0	264	171	98	47	23	12	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2
0	316	201	114	55	27	15	20	18	17	16	15	14	13	12	11	10	9	8	7	6	5
0	376	235	132	64	31	17	24	21	20	19	18	17	16	15	14	13	12	11	10	9	8
0	446	275	153	74	36	20	29	26	24	23	22	21	20	19	18	17	16	15	14	13	12
0	526	323	178	86	42	23	34	31	29	28	27	26	25	24	23	22	21	20	19	18	17
0	616	378	207	100	49	27	40	37	35	34	33	32	31	30	29	28	27	26	25	24	23
0	716	441	240	116	57	31	48	44	41	40	39	38	37	36	35	34	33	32	31	30	29
0	825	514	278	134	66	36	55	50	47	46	45	44	43	42	41	40	39	38	37	36	35
0	941	595	322	155	77	42	63	58	55	54	53	52	51	50	49	48	47	46	45	44	43
0	1060	684	372	179	89	48	71	66	63	62	61	60	59	58	57	56	55	54	53	52	51
0	1175	780	427	206	102	54	79	74	71	70	69	68	67	66	65	64	63	62	61	60	59
0	1280	877	487	234	117	62	85	80	77	76	75	74	73	72	71	70	69	68	67	66	65
0	1365	968	548	262	130	69	89	84	81	80	79	78	77	76	75	74	73	72	71	70	69
0	1419	1040	601	286	138	75	89	84	81	80	79	78	77	76	75	74	73	72	71	70	69
0	1471	1075	629	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	1526	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	1582	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	1638	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	1694	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	1750	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	1806	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	1862	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	1918	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	1974	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	2030	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	2086	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	2142	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	2198	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	2254	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	2310	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	2366	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	2422	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	2478	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	2534	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	2590	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	2646	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	2702	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	2758	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	2814	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	2870	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	2926	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	2982	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	3038	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	3094	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	3150	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	3206	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	3262	1078	659	297	137	79	80	75	72	71	70	69	68	67	66	65	64	63	62	61	60
0	3318	1078	659																		

JUNE SOLSTICE - SOLAR CYCLE MAXIMUM																								
LATITUDE = -4 degrees																								
ELECTRON DENSITY (10 ¹² /cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME																								
ELECTRON CONTENT (10 ¹² /cm ²)																								
630 nm 0+ RECOMBINATION AIRGLOW (rayleighs)																								
km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	9	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	17	9	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
980	20	11	5	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
960	23	13	6	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
940	26	14	6	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
920	29	17	8	4	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	33	19	9	5	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
880	38	22	10	6	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
860	43	25	12	7	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
840	49	29	14	8	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
820	56	34	17	9	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	64	39	20	11	6	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
780	72	45	23	12	7	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
760	82	51	27	15	8	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
740	94	59	32	17	9	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
720	107	68	37	20	11	6	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	121	78	44	24	13	7	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
680	138	90	51	28	15	9	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
660	157	104	60	32	18	10	6	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
640	179	119	70	38	21	12	7	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
620	204	137	82	45	25	15	9	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	231	158	96	52	30	18	12	7	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
580	263	181	112	61	35	22	15	9	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
560	298	208	130	72	41	26	18	10	6	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0
540	339	238	151	84	49	31	22	15	9	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0
520	383	272	175	99	58	38	32	20	13	7	4	2	1	0	0	0	0	0	0	0	0	0	0	0
500	433	311	202	115	68	45	37	23	15	9	5	2	1	0	0	0	0	0	0	0	0	0	0	0
480	488	353	233	135	80	54	44	27	18	10	6	3	2	1	0	0	0	0	0	0	0	0	0	0
460	549	400	266	157	95	65	52	31	20	13	7	4	2	1	0	0	0	0	0	0	0	0	0	0
440	613	450	302	183	112	78	60	36	23	15	9	5	2	1	0	0	0	0	0	0	0	0	0	0
420	681	503	341	211	132	92	74	42	27	18	10	6	3	2	1	0	0	0	0	0	0	0	0	0
400	749	556	380	243	156	108	80	47	31	20	13	7	4	2	1	0	0	0	0	0	0	0	0	0
380	814	606	419	278	183	126	108	54	35	22	15	9	5	2	1	0	0	0	0	0	0	0	0	0
360	871	647	453	308	213	145	126	60	38	24	16	9	5	2	1	0	0	0	0	0	0	0	0	0
340	909	674	480	336	237	163	145	66	41	27	18	10	6	3	2	1	0	0	0	0	0	0	0	0
320	921	678	495	351	239	177	153	67	42	28	18	10	6	3	2	1	0	0	0	0	0	0	0	0
300	981	644	487	341	226	184	142	67	43	29	18	10	6	3	2	1	0	0	0	0	0	0	0	0
280	759	553	415	287	197	164	142	67	43	29	18	10	6	3	2	1	0	0	0	0	0	0	0	0
260	547	395	285	201	152	98	86	45	30	18	12	7	4	2	1	0	0	0	0	0	0	0	0	0
240	289	203	145	110	98	32	42	22	14	8	5	2	1	0	0	0	0	0	0	0	0	0	0	0
220	90	58	49	45	47	4	15	7	22	24	26	25	24	23	21	18	15	14	12	10	8	5	3	2
200	11	6	9	12	15	0	4	16	118	125	143	138	163	156	146	129	74	23	3	1	0	0	0	0
180	0	0	1	2	2	0	1	2	49	46	73	91	83	71	68	29	6	0	0	0	0	0	0	0
Nmax	922	680	497	352	241	185	246	792	1321	1575	1785	1672	1544	1451	1384	1356	1361	1307	1423	1344	1402	1354	1402	1356
Hmax	323	327	311	314	332	341	305	340	393	333	403	411	433	437	425	431	431	431	442	478	429	361	341	339
Auf	65	67	86	47	16	54	25	78	37	14	22	282	243	256	167	53	60	55	61	74	82	192	52	42
Cuf	427	473	588	375	133	504	251	1070	441	133	648	2000	2006	1996	879	750	734	232	262	402	500	443	313	256
Alo	37	34	59	81	47	51	91	171	171	74	261	162	173	113	100	127	89	82	83	57	52	61	34	32
Clo	188	129	1090	2000	219	1871	1926	3813	5375	254	3867	2060	1930	465	313	758	297	316	531	168	152	590	86	70
TEC	26	16	12	8	5	4	5	14	26	38	50	57	61	63	61	48	45	44	40	33	3	3	7	7
F2x	258	196	152	114	88	51	60	258	458	505	593	478	473	454	438	421	381	298	150	58	120	229	298	294

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JUNE SOLSTICE - SOLAR CYCLE MAXIMUM																									ELECTRON DENSITY (10 ¹² /cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME																									430 nm 0+ RECOMBINATION AIRGLOW (rayleighs)																									LATITUDE = -4 degrees																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	LT	km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	LT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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JUNE SOLSTICE - SOLAR CYCLE MAXIMUM ELECTRON DENSITY (10¹²/cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME
 LATITUDE = +16 degrees TEC TOTAL ELECTRON CONTENT (10¹²/cc) 630 nm 0. RECOMBINATION AIRGLOW (rayleighs)

km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	6	3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	13	7	5	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
980	14	8	6	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
960	17	9	7	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
940	19	11	8	4	3	1	1	1	1	2	8	28	56	70	83	99	68	54	46	35	26	18	12	12
920	22	13	10	4	3	1	1	1	1	2	10	25	38	73	91	107	79	63	55	41	30	22	14	14
900	25	15	11	5	4	2	1	1	1	3	12	30	44	83	104	121	118	91	74	71	56	42	30	21
880	29	17	13	5	4	2	1	1	1	3	15	35	52	95	119	138	134	105	87	83	65	43	35	24
860	33	20	15	6	4	2	1	2	4	4	16	41	61	109	135	157	153	122	102	97	76	57	41	30
840	38	24	17	8	5	3	2	3	5	8	22	49	71	124	154	178	175	140	119	113	90	66	43	36
820	44	28	20	9	6	3	2	3	6	10	26	57	83	142	175	202	200	162	139	132	105	78	57	43
800	50	33	23	10	7	4	3	4	10	32	67	97	162	200	230	228	187	163	155	173	122	91	67	51
780	58	39	27	12	8	4	3	5	15	38	79	113	184	227	261	250	216	191	181	204	143	106	79	61
760	67	45	31	14	9	5	4	7	20	56	109	155	240	295	337	339	288	261	247	283	195	145	110	86
740	77	53	36	17	11	6	5	9	28	68	128	181	274	336	383	387	333	304	289	332	228	170	129	103
720	88	62	41	20	12	7	6	11	35	82	150	212	313	383	436	441	384	356	338	391	267	198	151	122
700	101	73	48	24	14	9	8	14	41	93	168	248	357	436	495	504	444	415	395	458	312	232	179	145
680	117	85	55	28	17	10	10	18	50	100	176	268	397	496	566	591	512	483	461	536	365	271	203	171
660	134	100	64	33	19	12	12	23	62	127	209	408	497	562	575	544	444	415	395	458	312	232	179	145
640	154	116	74	38	23	14	15	29	67	147	243	339	465	566	639	656	591	562	539	627	427	317	245	201
620	177	135	86	45	26	16	19	37	78	178	286	396	531	644	726	749	681	653	631	731	459	317	245	201
600	204	156	99	53	31	19	24	47	99	215	336	463	606	734	825	854	785	737	737	849	583	433	337	277
580	234	181	114	63	36	23	29	60	124	259	394	541	692	836	938	975	904	874	862	982	682	506	395	322
560	269	208	132	74	42	27	37	76	157	311	463	632	789	952	1066	1143	1039	1006	1007	1131	737	592	461	373
540	309	239	153	87	49	32	46	97	174	344	514	701	901	1070	1234	1316	1210	1152	1176	1293	931	692	537	428
520	356	272	176	102	57	37	57	124	248	446	639	857	1028	1233	1376	1449	1361	1310	1370	1465	1086	807	622	488
500	409	306	203	120	66	44	71	157	312	528	749	991	1171	1398	1561	1651	1544	1479	1591	1843	1284	951	711	551
480	469	345	234	142	77	51	89	200	391	623	875	1128	1324	1565	1755	1869	1734	1651	1830	1617	1453	1051	818	614
460	536	383	269	166	90	60	111	253	487	724	1006	1239	1448	1667	1870	2050	1917	1819	2050	1975	1673	1254	920	676
440	598	420	307	195	105	71	138	319	599	827	1095	1267	1450	1647	1845	2050	2067	1970	2210	2100	1856	1407	1015	731
420	616	454	347	227	122	83	172	400	717	921	1099	1244	1404	1591	1773	1992	2142	2087	2191	2171	1926	1438	1030	775
400	601	481	386	261	141	97	214	493	811	991	1059	1193	1322	1474	1654	1865	2103	2150	2064	2151	1878	1484	1122	803
380	563	499	417	290	163	111	265	585	828	1015	1005	1114	1208	1331	1493	1682	1951	2119	1838	1949	1744	1408	1076	806
360	496	501	428	300	185	122	322	641	812	931	930	1010	1070	1162	1299	1456	1697	1917	1534	1572	1514	1253	926	719
340	402	443	402	292	204	124	370	634	777	924	836	887	979	1084	1203	1375	1559	1186	1098	1202	1007	697	530	444
320	289	319	337	271	210	120	373	603	719	819	719	728	752	760	794	865	943	1027	1114	839	640	844	639	444
300	174	175	246	233	191	109	349	546	637	694	612	613	607	619	656	697	701	680	536	299	593	366	230	124
280	81	67	150	176	149	88	296	463	534	533	436	477	467	463	470	483	432	342	303	106	239	130	92	32
260	26	16	74	110	94	57	216	361	416	384	354	346	330	316	310	238	136	149	26	84	25	27	5	0
240	5	2	28	50	46	25	126	252	294	252	284	249	245	225	198	184	115	41	63	4	20	3	0	0
220	0	0	0	1	14	0	51	152	184	150	200	165	167	146	115	90	48	9	22	0	0	0	0	0
200	0	0	0	0	0	0	12	76	98	79	132	102	106	89	61	48	17	1	6	0	0	0	0	0
180	0	0	0	0	0	0	1	30	42	36	52	59	67	52	29	21	5	0	1	0	0	0	0	0
Nmax	617	503	428	300	210	124	377	642	829	1015	1097	1269	1460	1667	1870	2072	2144	2155	2219	2179	1927	1500	1122	810
Hmax	427	365	363	365	324	349	332	357	389	382	347	447	454	459	461	453	417	393	435	411	423	417	399	385
Aul	14	101	35	23	25	23	17	26	27	58	16	24	13	15	11	13	44	81	24	84	24	24	24	54
Cup	98	820	254	188	191	188	188	313	559	129	188	86	98	70	86	316	641	188	695	188	438	1063	188	1063
Alo	55	72	91	43	81	32	46	76	76	142	202	194	422	184	172	171	102	132	92	66	44	91	71	71
Clo	188	1875	1813	125	1938	63	250	441	250	1938	1938	1625	7750	2000	2000	2000	3750	2000	1875	1750	375	133	1801	1688
TEC	16	13	10	7	5	3	7	13	20	26	32	38	45	51	57	61	59	56	56	47	36	27	20	45
630	48	46	67	71	60	35	134	265	326	327	351	331	335	332	335	331	331	293	247	155	170	110	72	45

JUNE SOLSTICE - SOLAR CYCLE MAXIMUM ELECTRON DENSITY ($10^{+3}/\text{cc}$) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME
 LATITUDE = +24 degrees TEC - TOTAL ELECTRON CONTENT ($10^{+12}/\text{cm}^2$) 830 nm O₃ RECONVERSION AIRSOLAR MAX VALUE

JUNE SOLSTICE - SOLAR CYCLE MINIMUM		ELECTRON DENSITY ($10^{12}/\text{cm}^3$) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME																								
LATITUDE = -24 degrees		630 nm O+ RECOMBINATION AIRGLOW (rayleighs)																								
km		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
311	277	290	253	233	256	331	221	241	233	236	250	261	286	292	297	290	230	180	102	63	24	12	23	285	299	3
14	58	17	12	23	5	26	19	5	6	16	28	27	41	46	53	36	42	133	34	24	71	103	47	103	47	103
891	254	156	293	63	375	242	66	70	188	320	277	449	504	551	579	469	2000	438	305	1133	1871	688	1871	688	1871	688
101	41	35	81	50	81	131	50	91	41	51	71	48	24	48	51	91	37	71	41	51	71	41	51	71	41	51
3563	1675	129	5688	3664	1802	3910	3840	5250	1500	2000	1813	391	31	387	1938	172	195	1694	1875	3600	1975	5975	1975	5975	1975	5975
TEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
630	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

JUNE SOLSTICE - SOLAR CYCLE MINIMUM										ELECTRON DENSITY (10 ³ /cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME										630 nm 0+ RECOMBINATION AIRGLOW (rayleighs)										23 LT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
LATITUDE = -20 degrees										TEC - TOTAL ELECTRON CONTENT (10 ¹² /cm ²)										0+ RECOMBINATION AIRGLOW (rayleighs)										23 LT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000

65

JUNE SOLSTICE - SOLAR CYCLE MINIMUM												ELECTRON DENSITY (10 ³ /cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME												LATITUDE = -4 degrees												ELECTRON CONTENT (10 ¹² /cm ²)												630 nm												0. RECOMBINATION AIRGLOW (rayleighs)												23 LT											
km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT																																																											
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
940	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
880	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
860	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
840	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
820	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
760	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
740	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
680	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
660	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
640	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
620	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
580	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
560	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
540	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
520	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
480	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
460	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
440	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
420	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
380	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
360	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
340	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																											
280	0	0	0	0	0	0	0	0	0	0	0</																																																																								

JUNE SOLSTICE - SOLAR CYCLE MINIMUM		ELECTRON DENSITY (10 ³ 3/cc)											AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME											
LATITUDE = +4 degrees		TEC - TOTAL ELECTRON CONTENT (10 ¹⁶ 2/cm ²)											630 nm 0° RECOMBINATION AIRGLOW (ray/eighs)											
km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
940	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
880	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
860	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
840	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
820	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
780	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
760	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
740	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
720	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
680	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
660	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
640	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
620	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	6	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
580	8	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
560	10	7	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
540	13	9	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
520	16	11	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	21	14	6	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480	26	18	9	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
460	33	23	12	7	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
440	42	29	17	9	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420	54	37	22	12	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	68	47	30	16	10	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	86	60	39	21	13	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
360	108	76	49	27	19	11	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
340	134	96	60	34	25	13	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	161	117	71	40	33	16	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	185	132	80	46	38	18	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	190	125	95	51	32	20	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	148	93	79	52	17	20	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	73	48	38	28	4	15	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	18	13	7	3	0	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mmax	192	132	86	52	38	20	82	267	355	379	391	378	369	372	384	408	435	461	481	478	431	382	311	255
Hmax	285	297	271	261	299	263	289	285	309	361	366	383	385	391	373	367	350	360	343	297	283	309	300	300
h'p	29	18	102	102	19	221	9	18	26	18	113	143	163	197	92	65	87	57	46	36	107	88	16	16
Cup	348	219	1938	1875	320	7813	168	313	375	230	1875	2000	2000	1020	773	523	816	566	500	383	1563	1266	191	188
Alo	51	40	50	30	61	41	141	141	101	73	97	104	70	65	72	600	76	56	48	58	51	41	24	21
Clo	1813	586	3375	1949	3250	1625	5688	5875	1613	250	508	438	129	94	168	133	438	178	129	379	1750	1438	63	70
TEC	3	2	1	1	0	0	1	4	6	8	10	11	12	12	12	12	12	12	11	9	8	6	5	4
630	62	44	32	20	9	10	45	156	203	202	207	200	200	197	204	212	216	205	175	129	132	123	161	80

JUNE SOLSTICE - SOLAR CYCLE MINIMUM										ELECTRON DENSITY (10 ³ 3/cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME														630 nm 0+ RECOMBINATION AIRGLOW (rayleighs)										23 LT									
LATITUDE = +8 degrees										TEC - TOTAL ELECTRON CONTENT (10 ¹⁶ 12/cm ²)																																	
km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23																			
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
860	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
840	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
820	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
760	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
740	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
720	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
700	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
680	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
660	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
640	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
620	3	3	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
600	4	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
580	6	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
560	8	6	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
540	10	8	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
520	14	10	5	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
500	19	13	6	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
480	25	16	9	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
460	33	21	12	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
440	43	27	15	7	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
420	56	35	20	9	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
400	71	44	27	12	8	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																			
380	89	57	34	17	11	5	18	103	202	311	486	492	509	526	530	544	562	549	535	498	393	284	216	163																			
360	109	74	43	23	14	10	26	131	234	335	387	447	459	487	498	511	540	522	547	540	456	334	262	193																			
340	130	94	52	30	18	12	40	160	262	339	359	392	400	432	448	460	494	475	520	552	492	375	296	216																			
320	147	110	62	40	24	14	52	160	282	323	321	331	336	366	384	396	427	410	447	482	467	395	291	219																			
300	157	110	69	49	24	18	72	189	282	323	321	331	336	366	384	396	427	410	447	482	467	395	291	219																			
280	144	87	74	50	26	17	94	226	289	276	268	271	294	313	324	346	333	342	323	360	346	235	177	122																			
260	76	53	72	37	26	12	109	226	280	241	226	209	209	224	241	251	260	252	228	149	203	207	142	99																			
240	16	22	44	17	18	5	98	217	227	186	175	155	154	158	174	182	180	175	129	41	73	70	55	32																			
220	1	6	12	4	18	1	52	146	149	132	127	110	108	104	118	124	113	109	61	6	13	10	11	5																			
200	0	1	1	0	1	0	12	57	76	84	86	74	71	62	74	79	63	61	23	0	1	0	0	0																			
180	0	0	0	0	0	0	1	10	28	48	52	47	44	34	42	46	31	29	7	0	0	0	0	0																			
Nmax	158	116	75	52	27	18	110	228	292	340	416	540	580	553	543	558	565	558	547	553	493	395	300	221																			
Hmax	293	315	269	288	265	291	255	251	275	327	391	469	422	396	383	384	369	379	341	323	316	299	312	306																			
Ap	67	9	92	17	101	18	27	102	221	111	10	8	19	128	104	47	51	25	110	71	36	52	26	48																			
Cup	1000	113	1559	254	1930	313	500	1922	5672	1934	121	94	223	1891	1184	441	512	258	1566	902	441	684	324	688																			
A10	41	71	41	51	41	51	41	51	101	172	124	361	252	163	212	212	142	117	131	61	51	51	49	51																			
C10	1688	2000	1688	1750	1625	1813	1500	1938	3750	3938	746	9688	3938	1938	3813	2000	1063	3688	1688	968	1688	898	1434																				
TEC	2	2	1	1	0	0	1	3	5	7	9	12	14	15	15	14	13	12	10	8	6	5	3	0																			

JUNE SOLSTICE - SOLAR CYCLE MINIMUM
 LATITUDE = -12 degrees
 TEC - TOTAL ELECTRON CONTENT (10¹²/cm²)
 ELECTRON DENSITY (10¹²/cm³) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME
 630 nm 0° RECOMBINATION AIRGLOW (rayleighs)

km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nmax	123	80	67	36	24	11	106	216	258	310	408	547	719	898	954	849	779	719	645	628	472	326	203	166
Hmax	314	333	291	307	286	253	276	272	295	346	350	366	379	387	380	353	373	349	317	321	332	287	300	300
Apo	27	17	27	6	5	98	7	16	50	26	37	27	16	10	26	122	26	56	40	44	19	7	192	42
Cup	313	195	313	65	66	1258	125	191	633	313	438	313	188	117	316	2051	316	750	516	555	230	86	3938	473
Alp	32	51	33	51	41	81	102	191	110	132	172	133	172	311	102	132	111	88	60	38	36	41	41	41
C10	1875	63	1750	63	1625	1563	1813	3688	1801	879	1875	3750	2800	3875	17000	2000	1801	1930	1063	1520	313	188	1438	1563
TEC	2	1	1	1	1	0	0	3	5	7	9	11	14	17	18	16	14	13	10	8	5	4	3	3
630	28	28	22	21	9	6	67	140	173	182	192	195	214	224	235	252	281	264	235	180	137	84	61	36

JUNE SOLSTICE - SOLAR CYCLE MINIMUM																								ELECTRON DENSITY (10 ¹² /cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME																							
LATITUDE = +16 degrees																								630 nm 0+ RECOMBINATION AIRGLOW (rayleighs)																							
km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT																							
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
153	117	102	62	38	21	108	177	229	291	380	469	549	638	701	729	634	558	472	471	312	236	190	168																								
321	340	298	259	293	261	227	281	303	351	355	371	383	333	327	359	320	329	329	313	328	338	349	307																								
37	27	30	132	26	269	201	27	58	36	25	14	26	122	128	27	67	31	28	13	13	14	27	117																								
387	313	313	1938	313	7268	5871	313	703	438	254	371	313	1613	1762	313	754	316	285	125	125	137	313	1635																								
91	21	91	41	81	41	41	38	44	73	271	151	159	92	92	121	131	98	42	141	42	31	24	61																								
3813	12	3875	1625	1672	1688	1688	109	109	250	7734	1934	1891	1875	2000	1543	3668	1066	148	7663	207	74	23	3500																								
TEC	3	2	1	1	0	2	3	15	7	9	11	14	15	15	14	15	14	10	8	6	5	4	3																								
630	35	36	37	32	20	11	89	141	171	181	193	204	225	233	268	302	304	277	224	181	115	70	47	35																							

JUNE SOLSTICE - SOLAR CYCLE MINIMUM		ELECTRON DENSITY (10 ³ ·3/cc)												AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME											
LATITUDE = +20 degrees		TEC - TOTAL ELECTRON CONTENT (10 ¹⁶ ·12/cm ²)												630 nm 0. RECOMBINATION AIRGLOW (rayleighs)											
km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	LT
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
940	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
880	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
860	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
840	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
820	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
780	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
760	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
740	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
720	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	3	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
680	4	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
660	5	4	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
640	7	5	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
620	9	7	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	11	9	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
580	15	11	7	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
560	19	14	9	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
540	24	18	11	6	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
520	31	22	14	7	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	40	28	18	9	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480	51	36	23	11	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
460	64	45	29	15	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
440	80	57	37	19	9	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420	100	72	47	24	11	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	123	91	59	30	14	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	149	115	75	39	18	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
360	175	143	93	49	23	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
340	199	173	113	63	30	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	216	185	134	79	38	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	218	176	151	92	48	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	162	151	156	92	55	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	172	111	121	87	61	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	15	64	58	76	39	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	1	26	15	51	24	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	6	2	18	10	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	1	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nmax	221	185	157	92	55	28	121	177	224	308	416	535	631	688	713	675	571	479	410	454	370	320	281	233	
Hmax	305	324	283	292	279	301	270	267	288	335	338	353	365	372	366	341	359	315	313	299	313	321	333	347	
Ap	63	16	39	9	11	8	17	27	93	34	54	36	21	17	17	57	16	97	93	44	37	29	27	16	
Cup	801	188	473	109	133	102	313	281	1250	375	621	379	203	160	152	563	141	1027	992	422	383	301	313	188	
Alo	61	46	81	21	72	20	46	81	36	86	122	133	133	132	131	113	65	82	57	62	71	72	141	21	
Clo	3188	313	5813	16	1875	12	320	1688	185	566	1875	1875	2000	2000	1805	1938	223	1121	500	1938	1750	1750	5688	16	
TEC	4	3	2	1	0	2	3	5	7	9	12	14	16	16	16	16	16	12	10	9	7	6	5	4	
630	49	62	56	54	30	17	94	139	178	194	211	221	235	252	275	287	292	264	217	174	127	89	74	54	

DECEMBER SOLSTICE - SOLAR CYCLE MAXIMUM ELECTRON DENSITY ($10^{10.3}/\text{cc}$) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME
LATITUDE = -24 degrees TEC - TOTAL ELECTRON CONTENT ($10^{16.12}/\text{cm}^2$) 630 nm O-RECOMBINATION AIRGLOW (rayleighs)

75

DECEMBER SOLSTICE - SOLAR CYCLE MAXIMUM		ELECTRON DENSITY (10 ³ /cc)		AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME		LATITUDE = -12 degrees		TEC - TOTAL ELECTRON CONTENT (10 ¹² /cm ²)		630 nm		0+ RECOMBINATION AIRGLOW (rayleighs)		23 LT										
km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	9	6	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	23	14	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
980	27	17	6	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
960	32	20	7	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
940	38	24	9	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
920	45	28	11	6	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	54	33	13	7	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
880	65	40	16	9	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
860	77	47	19	11	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
840	91	56	24	13	4	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
820	109	66	29	16	5	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	130	78	35	19	6	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
780	154	93	43	22	7	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
760	184	110	53	27	9	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
740	219	131	64	32	11	6	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
720	260	155	78	39	13	7	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	310	184	95	47	16	8	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
680	368	218	116	56	20	10	11	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
660	437	258	141	67	24	12	14	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
640	518	306	171	81	29	15	18	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
620	614	363	208	97	36	18	23	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	725	431	252	117	44	22	30	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
580	854	511	304	140	53	27	38	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
560	1000	606	365	168	65	33	49	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
540	1163	718	437	201	80	39	62	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
520	1339	850	521	242	97	48	79	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	1518	1004	616	290	119	58	100	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480	1684	1180	722	347	144	70	127	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
460	1812	1367	838	415	175	85	160	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
440	1864	1532	959	494	212	103	200	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420	1796	1586	1079	584	256	126	248	55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	1500	1548	1189	685	306	151	301	65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	1265	1445	1274	790	360	182	356	73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
360	881	1266	1320	887	418	211	405	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
340	520	1009	1281	949	473	218	431	796	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	250	701	1051	932	514	211	412	741	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	93	399	685	789	526	194	336	630	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	25	169	329	555	438	160	225	482	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	5	47	106	312	249	109	118	327	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	1	7	20	133	80	52	47	194	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	0	0	0	2	41	11	13	98	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max	1864	1587	1324	956	527	218	432	801	1078	1269	1366	1558	1770	1919	2208	2261	2327	2306	2180	2094	1942	2031	2016	1955
Max	440	425	353	322	303	349	336	348	373	407	453	464	456	437	464	427	429	460	431	486	556	469	455	481
Max	55	22	87	38	50	13	46	70	81	58	23	34	59	133	44	137	74	34	136	83	28	133	162	29
Aur	480	188	87	348	504	125	563	941	1016	582	191	250	430	111	313	191	563	250	1254	698	215	1363	1863	238
Alt	51	53	72	102	51	33	101	142	132	212	213	204	442	292	183	222	182	211	141	161	64	131	91	55
Alt	1914	1917	1875	3500	1563	63	3500	3750	2000	3813	1934	2000	3625	2625	2000	5688	3813	3742	3625	3898	188	3750	1996	191
TEC	45	37	29	19	10	4	8	17	25	34	41	50	58	64	70	71	69	66	62	58	53	53	51	49
TEC	45	38	142	200	135	62	91	235	310	340	359	344	356	345	357	342	322	286	151	50	22	25	22	29

km	1864	1957	1324	956	527	218	332	801	1078	1269	1366	1558	1770	1919	2208	2261	2327	2306	2180	2094	1942	2031	2016	1955
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386	1510	1640	
km	1864	1957	1324	956	527	218	332	348	373	409	467	531	602	679	762	851	946	1047	1154	1267	1386			

DECEMBER SOLSTICE - SOLAR CYCLE MAXIMUM ELECTRON DENSITY (10³/cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME
 LATITUDE = -8 degrees TEC = TOTAL ELECTRON CONTENT (10¹²/cm²) 630 nm 0. RECOMBINATION AIRGLOW (rayleighs)

km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	4	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	11	5	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	28	13	9	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	33	16	11	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	40	20	13	6	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
700	48	24	16	7	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
600	58	29	19	8	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
500	70	35	22	10	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
400	84	43	27	12	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
300	101	52	32	14	5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
200	120	62	38	17	6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
100	144	75	45	21	7	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
0	172	91	53	25	9	3	4	5	9	20	73	137	283	341	372	379	339	377	369	425	423	330	284	229
700	204	110	64	29	10	4	5	9	20	73	137	283	341	372	379	339	377	369	425	423	330	284	229	268
600	242	132	76	35	13	5	6	11	25	87	165	289	377	455	482	501	446	498	491	567	572	445	385	314
500	287	159	90	42	15	6	8	14	32	105	199	315	434	524	548	573	511	569	563	652	660	515	448	366
400	338	191	107	50	18	7	10	18	41	126	239	388	500	601	624	654	585	648	645	748	756	594	516	427
300	397	228	127	60	22	9	12	23	52	152	287	430	575	687	709	744	659	734	735	853	860	683	596	496
200	464	273	152	72	27	11	15	29	66	182	344	503	660	782	805	843	762	827	834	968	970	780	685	575
100	540	325	180	86	33	14	19	37	85	219	410	587	775	885	913	887	927	942	1090	1084	885	783	664	564
0	624	385	214	102	40	17	24	48	108	263	497	695	866	996	1033	1067	1098	1032	1057	1217	1196	997	889	763
700	717	455	255	122	48	21	30	61	137	316	575	798	987	1113	1164	1189	1108	1142	1178	1345	1303	1112	1002	871
600	816	534	303	146	58	26	38	78	175	380	675	927	1181	1234	1305	1316	1243	1264	1303	1467	1397	1224	1119	987
500	921	624	360	175	71	32	48	100	223	456	785	1020	1258	1355	1451	1444	1384	1367	1427	1575	1471	1329	1233	1106
400	1058	722	427	209	86	39	60	128	283	548	904	1227	1393	1471	1593	1669	1527	1476	1547	1657	1517	1415	1337	1224
300	1134	829	505	249	104	48	76	163	359	658	1027	1357	1518	1576	1716	1684	1684	1579	1656	1701	1526	1472	1420	1332
200	1234	941	596	298	126	59	95	209	453	788	1150	1472	1612	1662	1796	1782	1786	1671	1748	1698	1577	1482	1421	1421
100	1320	1055	700	356	153	73	120	267	568	938	1263	1490	1647	1721	1808	1856	1879	1748	1814	1847	1855	1445	1476	1476
0	1388	1166	816	425	185	89	151	339	702	1099	1355	1478	1636	1744	1792	1895	1927	1807	1846	1846	1832	1379	1275	1426
700	1427	1265	940	507	225	110	190	429	849	1235	1412	1451	1604	1732	1758	1894	1920	1841	1832	1786	1754	1659	1290	1290
600	1428	1343	1063	604	272	135	238	536	986	1263	1422	1489	1551	1690	1704	1856	1873	1847	1754	1754	1659	1290	1290	1290
500	1322	1391	1167	716	330	166	296	651	1069	1247	1393	1351	1476	1618	1628	1779	1786	1786	1609	1609	1651	1222	385	517
400	1190	1394	1222	836	399	203	359	744	1069	1213	1331	1276	1381	1518	1530	1665	1659	1652	1408	1408	1651	222	385	517
300	896	1305	1212	928	481	245	401	762	1047	1158	1238	1195	1269	1393	1411	1517	1498	1452	1166	1166	412	98	199	280
200	597	1106	1153	932	566	299	396	746	1002	1082	1119	1079	1142	1247	1273	1343	1310	1210	907	224	34	83	120	267
100	266	802	1025	894	604	323	374	710	934	985	982	961	1005	1087	1119	1152	1107	951	658	100	9	26	37	106
0	112	513	811	808	591	321	330	649	840	869	835	834	863	919	955	953	859	703	440	35	1	6	8	29
700	36	254	527	664	548	273	262	563	722	738	687	702	721	753	787	758	700	486	268	9	0	1	1	5
600	9	92	246	470	460	191	176	452	586	600	545	572	585	596	623	578	519	312	147	1	0	0	0	0
500	0	3	7	100	157	45	30	208	306	335	307	335	348	331	337	290	243	102	30	0	0	0	0	0
400	0	0	0	0	0	13	5	109	188	225	216	238	254	230	226	189	151	51	11	0	0	0	0	0
300	0	0	0	0	2	3	0	44	99	138	146	150	178	153	141	115	87	23	3	0	0	0	0	0
200	0	0	0	0	0	0	0	12	44	76	94	100	118	96	81	66	47	9	1	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1435	1400	1224	938	605	329	401	763	1074	1264	1424	1491	1647	1744	1810	1900	1930	1849	1848	1706	1528	1490	1481	1488
hmax	427	407	396	373	344	331	378	369	415	449	447	509	471	474	445	474	445	474	532	545	523	508	487	487
hmin	143	116	44	18	13	24	17	26	36	20	96	32	53	124	48	125	90	223	135	96	136	94	86	85
Cup	1367	1129	383	160	125	105	195	320	438	184	938	250	379	980	313	945	583	200	1070	750	1350	754	680	691
Alp	111	71	38	43	32	161	44	64	84	113	362	145	218	222	134	204	193	271	152	82	91	88	73	66
Clo	2563	852	94	125	63	3563	137	188	254	379	7688	422	1395	1938	379	1938	1805	1750	1938	402	528	820	581	438
TEC	39	36	30	21	12	6	8	17	27	37	46	53	61	67	72	69	66	62	54	42	43	42	42	42
630	26	73	112	169	168	73	70	227	337	383	377	395	413	411	422	405	372	249	145	28	7	9	9	14

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DECEMBER SOLSTICE - SOLAR CYCLE MAXIMUM ELECTRON DENSITY (10^{12} cm $^{-3}$) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME
 LATITUDE = +0 degrees TEC - TOTAL ELECTRON CONTENT (10^{12} cm $^{-2}$) 830 nm 0. RECOMBINATION AIRGLOW (Rayleighs)

km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	6	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	12	6	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	25	13	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	49	27	17	6	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
980	56	31	19	7	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
960	64	36	22	8	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
940	73	41	26	9	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
920	84	48	30	11	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	97	55	34	13	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
880	111	64	39	15	3	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
860	127	74	45	17	4	3	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
840	145	86	52	21	5	3	2	3	13	36	87	168	261	324	339	349	354	362	365	368	372	375	378	381
820	166	99	60	24	6	4	2	4	16	44	103	199	302	365	379	382	389	391	390	412	404	306	259	214
800	190	114	69	29	8	5	3	6	19	53	122	234	348	409	422	421	389	412	435	467	458	349	296	245
780	218	132	79	34	10	5	4	7	24	64	145	276	399	458	469	464	433	456	484	527	517	396	338	281
760	249	152	91	40	12	7	5	9	30	77	172	324	456	511	520	511	481	506	539	594	582	449	384	320
740	284	175	105	47	15	8	7	12	37	93	203	379	518	569	576	563	533	560	599	667	652	505	434	364
720	324	202	121	55	19	10	9	16	45	112	241	441	585	630	636	619	591	620	663	746	727	567	488	412
700	368	232	139	65	23	11	11	20	56	135	286	511	657	696	700	679	653	686	734	830	804	632	546	464
680	418	266	160	76	28	14	14	26	70	162	339	590	733	765	768	744	720	757	809	919	883	698	607	519
660	473	305	184	89	35	17	19	33	87	195	401	676	813	837	813	793	834	890	1011	1160	1066	869	777	696
640	533	348	211	105	43	20	24	42	107	235	475	770	898	911	915	887	932	917	974	1103	1032	830	730	637
620	597	396	243	123	52	24	30	54	133	284	561	870	980	988	992	965	951	1005	1062	1195	1094	889	788	696
600	664	450	278	145	64	29	39	70	165	341	662	976	1063	1064	1070	1046	1035	1098	1152	1281	1142	937	838	754
580	731	508	319	169	77	35	49	89	204	411	779	1063	1145	1140	1140	1129	1122	1184	1242	1358	1170	959	878	806
560	794	570	364	198	93	42	52	114	252	494	913	1190	1222	1212	1225	1212	1210	1290	1330	1420	1170	960	901	850
540	849	635	415	230	111	50	77	145	311	593	1062	1292	1293	1281	1298	1294	1296	1384	1412	1464	1131	962	904	882
520	888	701	471	267	133	61	96	184	383	709	1223	1363	1355	1343	1364	1371	1378	1470	1485	1483	1045	905	874	898
500	902	766	532	316	157	73	117	232	470	845	1383	1458	1405	1397	1423	1440	1453	1543	1544	1465	910	806	805	891
480	891	825	597	356	184	88	142	291	575	1000	1523	1511	1442	1440	1470	1497	1517	1534	1583	1394	734	666	695	845
460	858	874	663	408	214	106	170	362	698	1170	1607	1536	1463	1470	1503	1566	1615	1598	1264	536	500	553	755	655
440	796	906	725	463	247	128	201	445	837	1342	1610	1562	1466	1485	1519	1554	1594	1601	1575	1076	343	329	395	626
420	703	916	788	520	281	154	233	538	988	1493	1587	1508	1451	1483	1514	1544	1597	1551	1496	846	186	183	245	471
400	579	898	834	576	316	184	264	638	1137	1578	1539	1461	1415	1454	1481	1506	1558	1464	1361	600	81	81	127	313
380	434	845	857	628	351	221	293	735	1258	1568	1464	1360	1354	1394	1416	1434	1471	1338	1176	374	26	26	52	178
360	285	751	850	671	383	259	317	816	1313	1500	1361	1292	1260	1302	1319	1329	1330	1178	958	197	6	6	16	83
340	157	613	803	698	410	288	333	861	1280	1378	1231	1171	1158	1181	1190	1192	1168	986	723	84	1	1	3	30
320	68	444	703	699	431	283	336	847	1172	1208	1076	1028	1025	1035	1036	1027	972	782	502	27	0	0	8	0
300	21	270	546	629	443	257	286	748	996	1003	903	870	875	872	864	844	766	580	315	6	0	0	0	1
280	4	128	349	478	430	211	129	576	776	784	721	705	714	701	685	656	567	396	176	1	0	0	0	0
260	0	43	165	286	300	153	30	375	545	571	543	541	535	535	512	476	392	245	85	0	0	0	0	0
240	0	8	48	122	120	94	2	198	339	384	380	391	402	383	357	318	250	135	35	0	0	0	0	0
220	0	1	6	33	21	47	0	81	183	235	243	262	271	256	230	193	146	65	12	0	0	0	0	0
200	0	0	0	0	4	1	18	24	83	130	140	160	167	157	135	104	77	26	3	0	0	0	0	0
180	0	0	0	0	0	5	0	5	31	63	71	88	92	88	71	49	36	9	1	0	0	0	0	0
Nmax	902	916	859	703	444	289	338	865	1313	1583	1614	1537	1467	1487	1520	1554	1600	1615	1599	1483	1174	931	945	899
Hmax	501	423	327	289	269	323	333	359	395	453	455	446	431	433	437	427	439	459	451	517	569	561	547	513
Auf	73	94	68	84	172	16	143	69	48	41	44	166	352	284	188	110	132	83	126	138	115	168	116	138
Cup	500	688	480	691	2000	148	2000	871	516	383	375	1563	381	2000	1172	559	750	438	734	980	824	781	863	1655
Alo	63	55	43	58	51	78	51	92	122	148	105	115	112	136	112	111	157	108	118	81	76	71	77	82
Clo	198	199	152	883	2000	938	2000	2000	2000	1766	316	379	535	813	691	508	1688	543	1082	504	445	391	512	664
TEC	29	28	24	17	10	6	7	17	29	41	51	58	62	65	66	67	65	64	61	51	39	32	29	29
630	16	70	130	169	140	95	51	244	392	454	447	453	458	451	440	423	382	277	157	25	4	2	6	6

DECEMBER SOLSTICE - SOLAR CYCLE MAXIMUM ELECTRON DENSITY (10¹² cm⁻³/cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME
 LATITUDE = -4 degrees TEC - TOTAL ELECTRON CONTENT (10¹² cm⁻²) 830 nm 0- RECOMBINATION AIRGLOW (rayleighs)

km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	LT
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	4	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	9	8	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	20	16	5	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	43	31	16	5	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	58	41	21	7	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	68	47	25	8	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	79	54	28	10	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	92	61	33	12	4	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	106	70	38	14	5	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	123	80	43	16	5	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	143	92	50	19	6	3	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	165	105	57	22	7	3	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	191	120	66	26	9	4	4	2	12	36	96	182	280	365	376	381	384	367	397	435	451	348	298	245	281
760	220	137	76	31	11	5	4	3	15	43	114	215	330	412	421	421	384	407	439	490	513	397	341	281	281
740	252	156	87	36	12	5	6	4	19	52	134	254	386	485	469	465	427	452	485	552	582	452	389	322	322
720	292	179	100	43	15	6	8	5	23	63	159	299	449	522	523	512	474	501	537	620	657	514	442	368	368
700	335	233	132	59	21	9	11	10	29	77	188	352	519	585	582	565	527	555	594	697	739	581	502	420	420
680	437	266	152	69	25	11	14	13	45	112	262	485	691	777	714	684	647	680	725	875	917	735	640	541	541
660	496	303	175	80	30	13	16	17	56	135	309	566	773	896	789	752	716	752	801	977	1012	820	717	611	611
640	561	346	201	94	35	16	20	23	70	163	365	659	870	889	868	825	790	831	885	1086	1106	908	799	686	686
620	631	393	230	110	42	19	24	31	87	198	432	764	971	976	952	903	870	916	977	1201	1196	935	883	765	765
600	706	446	263	128	49	27	36	41	108	239	510	881	1076	1065	1030	987	956	1008	1076	1310	1279	1073	966	848	848
580	795	506	301	150	59	27	36	55	135	289	603	1010	1183	1157	1130	1075	1046	1107	1184	1434	1368	1153	1044	931	931
560	866	572	344	174	70	32	53	72	168	349	712	1150	1288	1248	1222	1167	1141	1212	1299	1538	1398	1212	1112	1011	1011
540	946	644	392	202	83	38	53	95	209	422	841	1298	1351	1339	1315	1262	1239	1320	1418	1618	1421	1247	1163	1084	1084
520	1022	721	445	234	98	45	64	124	260	510	993	1448	1486	1425	1405	1357	1337	1429	1537	1659	1404	1250	1190	1145	1145
500	1091	803	504	270	116	54	78	161	324	617	1173	1596	1573	1506	1491	1451	1434	1535	1648	1651	1320	1207	1184	1187	1187
480	1148	887	567	310	138	64	94	207	402	745	1383	1732	1647	1577	1568	1539	1526	1632	1736	1602	1164	1110	1136	1203	1203
460	1188	969	635	353	163	76	114	263	499	900	1623	1845	1705	1638	1634	1617	1608	1711	1779	1501	947	957	1038	1185	1185
440	1205	1045	705	400	192	91	138	331	616	1084	1868	1948	1764	1714	1717	1721	1721	1721	1771	1699	1121	453	542	690	1002
420	1188	1105	774	450	225	108	167	409	757	1351	1974	1918	1755	1724	1732	1732	1732	1744	1718	1577	856	251	337	474	830
400	1119	1142	839	500	262	127	200	457	921	1541	1974	1918	1755	1724	1732	1732	1732	1744	1718	1577	856	251	337	474	830
380	989	1144	895	548	301	150	235	590	1101	1769	1897	1832	1698	1698	1687	1693	1717	1596	1393	576	114	174	275	620	620
360	802	1009	933	592	339	174	263	681	1279	1871	1766	1690	1590	1501	1435	1431	1431	1431	1431	1431	1431	1431	1431	1431	1431
340	579	1076	945	627	371	198	264	782	1416	1798	1585	1501	1435	1467	1435	1431	1431	1431	1431	1431	1431	1431	1431	1431	1431
320	356	887	915	648	387	218	242	818	1444	1608	1362	1276	1244	1275	1237	1223	1190	915	602	46	2	4	9	87	87
300	177	694	818	645	378	224	200	838	1300	1329	1112	1033	1029	1051	1011	966	918	658	357	9	0	1	1	25	25
280	65	470	641	565	339	196	147	719	1013	1005	855	792	808	816	780	745	648	431	176	1	0	0	0	0	0
260	16	257	405	265	135	92	446	673	689	612	571	539	501	501	501	501	501	501	501	501	501	501	501	501	501
240	2	164	179	219	169	69	49	185	375	424	404	384	416	385	379	335	234	132	19	0	0	0	0	0	0
220	0	27	44	80	78	24	20	46	171	231	242	239	288	242	235	195	115	59	4	0	0	0	0	0	0
200	0	4	4	17	22	5	7	6	63	110	129	136	159	133	133	102	46	23	0	0	0	0	0	0	0
180	0	0	0	2	3	1	2	0	18	45	60	71	86	65	68	47	17	7	0	0	0	0	0	0	0
Nmax	1205	1148	945	652	388	224	267	838	1452	1871	2000	1949	1765	1724	1726	1733	1744	1774	1780	1661	1422	1254	1192	1203	1203
Hmax	437	369	342	308	317	303	351	301	326	362	421	421	412	400	403	397	426	457	515	535	528	513	479	479	479
Aup	132	75	79	96	44	35	21	167	38	21	15	107	422	255	163	99	113	72	45	63	125	97	96	109	109
Cup	1016	504	555	777	379	309	203	1625	418	199	125	922	5809	2000	500	625	375	227	379	926	688	680	797	797	797
Alo	65	53	40	59	46	19	102	91	191	191	124	172	152	182	152	131	132	75	62	88	77	65	64	64	64
Clo	375	188	180	1074	313	3875	1938	5313	1438	5813	867	2060	1813	2738	1934	1801	1543	320	188	824	504	313	309	309	309
TEC	39	35	27	17	9	4	5	15	27	40	53	63	66	69	68	65	65	65	63	56	46	46	46	46	46
630	55	179	225	213	148	74	66	252	445	523	503	488	504	494	489	468	409	304	169	36	8	8	9	9	9

DECEMBER SOLSTICE - SOLAR CYCLE MAXIMUM ELECTRON DENSITY (10¹²/cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME
 LATITUDE = +8 degrees TEC - TOTAL ELECTRON CONTENT (10¹²/cm²) 630 nm 0° RECOMBINATION AIRGLOW (rayleighs)

km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	6	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	11	7	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	23	14	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	47	28	8	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
980	55	33	10	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
960	63	38	12	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
940	73	43	14	8	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
920	84	50	17	9	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	96	58	20	11	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
880	111	66	24	12	4	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
860	129	77	29	14	5	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
840	147	88	35	17	5	2	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
820	170	102	41	20	6	2	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	196	117	49	23	8	2	2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
780	225	135	58	27	9	3	2	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
760	260	155	69	32	11	3	3	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
740	299	179	82	37	13	4	4	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
720	344	206	98	43	15	5	5	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	396	237	116	51	18	6	7	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
680	456	273	137	59	21	8	8	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
660	524	315	162	69	25	9	10	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
640	602	362	190	81	29	11	13	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
620	692	417	224	94	34	13	16	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	793	479	262	110	40	16	20	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
580	907	550	306	129	48	20	25	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
560	1035	631	366	150	56	24	31	56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
540	1177	724	413	175	68	28	38	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
520	1333	828	476	204	78	34	47	88	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	1499	944	546	238	92	40	57	109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480	1671	1074	623	276	108	47	68	136	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
460	1842	1214	705	320	126	56	80	170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
440	1996	1364	791	370	148	65	93	212	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420	2117	1519	880	424	172	75	107	265	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	2179	1670	969	483	199	86	121	331	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	2164	1804	1053	545	228	98	134	413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
360	2070	1995	1128	603	259	110	145	515	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
340	1969	1947	1189	653	289	121	153	637	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	1839	1864	1231	693	316	130	156	695	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	1697	1738	1247	679	335	138	147	685	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	622	1410	1152	620	341	142	115	608	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	247	938	855	495	293	138	70	439	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	56	446	467	322	188	90	30	337	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	5	120	167	153	80	29	8	158	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	12	33	45	20	3	1	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nmax	2182	1947	1247	687	341	143	156	686	1253	1753	2043	2616	2484	2379	2227	2077	2079	2057	2087	1958	1957	1975	2048	2160
Hmax	395	339	299	311	283	269	317	328	291	326	383	385	437	417	385	357	373	390	407	464	494	485	447	413
Apo	65	64	146	55	61	124	142	6	53	14	13	25	24	45	97	166	83	82	74	105	106	64	112	116
Cup	461	453	1313	430	508	1250	1801	66	617	133	125	195	191	297	625	1125	500	438	727	801	453	895	930	
Alo	44	38	60	47	62	41	71	33	91	92	76	122	93	114	131	102	111	112	101	68	78	55	88	72
Clo	125	148	1422	375	1938	1438	1875	375	1938	1438	1875	375	1938	1438	1875	375	1938	1438	1875	1738	438	641	176	1078
TEC	53	53	33	17	7	3	12	22	33	45	20	3	6	2	2	2	2	2	2	2	2	2	2	2
630	225	451	406	267	148	65	45	289	466	594	604	540	599	600	584	545	505	370	222	68	28	37	55	109

DECEMBER SOLSTICE - SOLAR CYCLE MAXIMUM ELECTRON DENSITY ($10^{-3}/\text{cc}$) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME
 LATITUDE - $+16$ degrees f_{EC} - TOTAL ELECTRON CONTENT ($10^{-12}/\text{cm}^2$) 630 nm O- RECOMBINATION AIRGLOW (rayleighs)

DECEMBER SOLSTICE - SOLAR CYCLE MAXIMUM												ELECTRON DENSITY (10 ³ ·3/cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME												
LATITUDE = +20 degrees												630 nm 0- RECOMBINATION AIRGLOW (rayleighs)												
TEC - TOTAL ELECTRON CONTENT (10 ⁶ ·3/cm ²)																								
km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	2	3	4	0	0	0	0	0	0	0	1	3	9	13	16	21	27	24	19	13	8	4	0	0
980	3	4	4	0	0	0	0	0	0	0	1	4	7	20	29	38	47	42	34	35	26	18	12	10
960	4	5	5	0	0	0	0	0	0	0	1	4	8	23	32	42	48	53	44	44	35	25	15	12
940	5	6	6	1	0	0	0	0	0	0	1	5	9	27	36	46	54	65	59	49	50	40	30	19
920	7	8	7	1	1	0	0	0	0	0	2	6	11	30	41	54	61	72	66	56	46	35	22	24
900	9	10	9	1	1	0	0	0	0	0	3	7	13	35	47	61	69	81	73	63	53	41	27	26
880	11	12	11	1	1	0	0	0	0	0	4	10	18	46	61	78	88	101	91	80	71	62	49	33
860	15	15	13	2	1	0	0	0	0	0	5	12	21	52	70	89	99	113	102	90	81	68	48	38
840	20	18	15	2	2	0	0	0	0	0	6	14	25	60	79	100	112	126	114	102	91	83	68	51
820	26	22	18	3	2	1	0	0	0	0	7	17	30	68	91	113	126	141	127	115	116	110	96	71
800	34	28	22	4	3	1	1	0	0	0	8	20	35	78	103	128	142	157	142	130	131	128	113	87
780	44	34	26	4	3	1	1	0	0	0	10	24	41	89	118	145	160	176	159	146	147	148	134	105
760	57	42	31	6	3	1	1	0	0	0	11	28	48	102	134	164	180	196	178	165	166	171	158	120
740	74	51	37	7	4	1	1	0	0	0	15	33	57	117	153	185	203	219	198	186	188	197	187	145
720	95	63	44	9	5	1	2	0	0	0	21	47	79	153	199	237	258	273	247	237	239	263	261	175
700	121	78	53	12	6	2	3	0	0	0	26	56	93	175	227	268	291	305	276	267	270	304	308	274
680	154	95	63	15	7	2	3	1	0	0	31	66	109	200	252	293	327	341	309	302	304	351	351	309
660	194	117	75	20	8	3	4	1	0	0	38	78	129	229	286	342	369	381	345	340	344	405	428	399
640	243	144	90	25	10	4	5	1	0	0	46	93	151	262	337	387	416	426	385	383	388	468	504	479
620	302	177	108	32	12	4	6	2	0	0	56	110	178	300	385	438	469	475	430	432	437	539	593	574
600	372	216	129	40	14	5	8	2	0	0	68	130	210	343	439	495	528	531	481	486	493	620	694	684
580	454	265	154	51	17	6	9	3	0	0	82	154	247	393	500	560	595	593	537	547	556	711	811	829
560	548	323	185	64	21	8	11	4	0	0	99	183	291	449	571	633	671	663	600	614	626	812	941	955
540	654	393	221	80	25	9	14	5	0	0	120	216	342	514	650	715	756	740	670	689	704	922	1085	1113
520	771	477	264	100	29	11	16	6	0	0	146	256	403	588	740	809	851	827	748	771	791	1038	1234	1282
500	896	576	316	124	35	11	19	7	0	0	178	285	440	633	804	874	914	886	806	835	855	1153	1304	1454
480	1025	691	378	153	42	14	22	8	0	0	214	337	474	673	842	914	958	924	836	864	885	1153	1304	1454
460	1153	821	453	187	51	16	26	11	0	0	260	357	557	769	956	1034	1076	1032	934	954	986	1254	1538	1616
440	1274	963	541	227	61	20	26	14	0	0	280	421	655	880	1082	1169	1207	1152	1043	1052	1090	1323	1650	1748
420	1378	1111	647	273	73	23	29	15	0	0	315	495	767	1004	1217	1321	1346	1286	1163	1150	1189	1337	1704	1826
400	1458	1255	771	323	87	28	33	17	0	0	382	578	892	1143	1357	1492	1488	1430	1291	1242	1271	1312	1670	1818
380	1504	1374	913	378	104	33	35	21	0	0	462	670	1020	1287	1490	1643	1618	1557	1392	1319	1314	1247	1532	1652
360	1497	1446	1055	435	125	39	38	25	0	0	557	766	1123	1401	1591	1636	1705	1575	1391	1369	1285	1132	1290	1334
340	1272	1431	1129	491	149	46	39	30	0	0	657	860	1140	1409	1625	1585	1700	1535	1354	1372	1161	961	973	
320	857	1264	1111	542	174	52	39	34	0	0	706	935	1105	1331	1545	1481	1582	1442	1270	1261	950	737	638	
300	432	960	1046	582	193	58	37	34	0	0	693	969	1018	1170	1341	1312	1356	1283	1127	1077	691	489	349	
280	152	601	907	607	193	60	33	38	0	0	645	885	865	937	1043	1077	1053	1053	917	719	434	261	151	
260	34	294	677	598	182	54	26	33	0	0	799	790	727	765	651	651	651	651	651	651	651	651	651	
240	4	105	383	416	155	42	18	23	0	0	341	348	349	309	410	492	435	464	374	192	97	25	11	
220	0	25	131	164	107	26	10	7	0	0	121	132	179	194	194	241	220	215	154	66	32	3	1	
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Nmax	1514	1455	1129	612	195	60	39	398	706	959	1144	1419	1626	1648	1717	1580	1399	1380	1315	1339	1705	1838	1687	1672
Hmax	367	351	341	267	295	282	287	281	303	219	329	331	323	357	331	351	355	357	356	407	397	390	431	403
h'p	210	210	210	67	17	128	16	38	153	47	13	45	23	18	38	7	32	12	62	42	49	60	77	34
Cup	3195	695	152	1625	145	352	1938	504	125	383	188	121	250	43	191	66	66	375	254	355	504	750	316	594
h'f	91	81	33	61	28	101	57	91	25	91	44	73	102	53	111	50	45	91	101	52	80	91	54	91
C1o	3563	1680	63	3375	55	3625	387	5688	31	3875	125	617	1875	125	1910	121	82	1852	1742	125	855	1750	188	1852
TEC	34	31	24	12	4	1	1	7	14	20	27	36	43	46	48	47	42	40	37	39	43	43	40	
TEC	330	110	226	345	283	121	35	18	188	435	565	691	712	746	742	738	652	535	382	263	208	161	109	

Mmax	1514	1455	1129	612	195	60	39	388	706	969	1144	1419	1666	1648	1717	1580	1399	1380	1315	1339	1705	1838	1687	1672
Hmax	367	351	341	267	295	282	327	281	303	279	329	331	323	357	331	351	355	327	356	407	397	390	431	403
Aup	210	67	17	128	16	38	153	47	13	45	23	18	38	7	32	12	62	42	49	60	77	34	62	
Cup	3195	695	152	1625	145	352	1938	504	125	383	188	121	250	43	191	66	66	33	254	355	504	750	316	
Alp	91	81	33	61	28	101	57	91	25	91	44	73	102	53	111	50	45	91	101	52	80	91	54	
Clp	3563	1680	63	3375	55	3625	387	5688	31	3875	125	617	1875	125	1910	121	82	1852	1742	125	855	1750	188	
TEC	34	31	24	12	4	1	1	7	14	20	27	36	43	46	48	47	42	40	37	39	43	40	38	
530	110	226	345	283	121	35	18	188	435	545	605	661	712	746	742	738	652	535	382	263	208	161	109	

DECEMBER SOLSTICE - SOLAR CYCLE MINIMUM ELECTRON DENSITY (10³·3/cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME
 LATITUDE = -24 degrees TEC - TOTAL ELECTRON CONTENT (10¹²·12/cm²) 630 nm 0° RECOMBINATION AIRGLOW (rayleighs)

km	00	01	02	03	04	05	06	07	08	09	11	12	13	14	15	16	17	18	19	20	21	22	23 L	
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Nmax	328	283	243	185	107	66	158	194	235	306	402	510	643	717	777	795	720	618	541	578	507	419	425	335
Hmax	358	317	303	288	265	294	237	237	249	321	350	335	357	379	345	355	353	363	323	336	332	317	343	365
Ap	28	52	43	37	47	16	87	142	165	55	26	92	46	14	72	35	34	16	106	18	35	133	31	27
Cup	297	695	492	438	566	195	1387	1938	2000	625	266	1199	500	129	730	320	313	141	1188	156	332	1813	320	320
Clo	101	81	61	81	41	78	50	41	51	67	101	123	141	102	123	132	54	92	35	81	51	101	21	
TEC	3488	3875	2000	3875	1625	1500	3328	1688	1750	375	789	2000	1938	1801	1875	1938	2000	125	1688	125	1918	1938	3375	16
630	64	61	72	74	52	38	117	159	187	208	226	231	247	267	277	320	330	312	256	204	145	87	78	54

DECEMBER SOLSTICE - SOLAR CYCLE MINIMUM ELECTRON DENSITY (10³ cm⁻³/cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME
 LATITUDE = -16 degrees TEC - TOTAL ELECTRON CONTENT (10¹² cm⁻²) 630 nm 0° RECOMBINATION AIRGLOW (Rayleighs)

km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	2	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	3	2	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	4	3	2	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	5	4	3	2	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	6	5	3	2	2	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	10	9	6	4	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1500	13	10	7	4	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1400	15	12	9	5	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1300	18	15	11	6	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1200	22	19	14	8	4	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1100	26	22	17	10	5	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1000	32	28	21	13	6	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
900	38	31	22	13	7	4	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
800	45	38	26	16	8	5	4	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
700	55	45	32	19	10	6	5	4	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
600	65	54	38	23	12	7	6	5	4	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1
500	78	64	45	27	15	9	8	7	6	5	4	3	2	1	1	1	1	1	1	1	1	1	1	1
400	93	75	53	32	17	11	10	9	8	7	6	5	4	3	2	1	1	1	1	1	1	1	1	1
300	110	88	62	38	21	14	12	10	9	8	7	6	5	4	3	2	1	1	1	1	1	1	1	1
200	127	101	73	45	25	16	13	11	10	9	8	7	6	5	4	3	2	1	1	1	1	1	1	1
100	144	114	83	53	29	20	16	14	12	10	9	8	7	6	5	4	3	2	1	1	1	1	1	1
0	156	125	93	61	33	23	18	15	13	11	10	9	8	7	6	5	4	3	2	1	1	1	1	1
1600	130	131	107	76	42	28	20	16	14	12	10	9	8	7	6	5	4	3	2	1	1	1	1	1
1500	139	131	107	76	42	28	20	16	14	12	10	9	8	7	6	5	4	3	2	1	1	1	1	1
1400	139	131	107	76	42	28	20	16	14	12	10	9	8	7	6	5	4	3	2	1	1	1	1	1
1300	139	131	107	76	42	28	20	16	14	12	10	9	8	7	6	5	4	3	2	1	1	1	1	1
1200	139	131	107	76	42	28	20	16	14	12	10	9	8	7	6	5	4	3	2	1	1	1	1	1
1100	139	131	107	76	42	28	20	16	14	12	10	9	8	7	6	5	4	3	2	1	1	1	1	1
1000	139	131	107	76	42	28	20	16	14	12	10	9	8	7	6	5	4	3	2	1	1	1	1	1
900	139	131	107	76	42	28	20	16	14	12	10	9	8	7	6	5	4	3	2	1	1	1	1	1
800	139	131	107	76	42	28	20	16	14	12	10	9	8	7	6	5	4	3	2	1	1	1	1	1
700	139	131	107	76	42	28	20	16	14	12	10	9	8	7	6	5	4	3	2	1	1	1	1	1
600	139	131	107	76	42	28	20	16	14	12	10	9	8	7	6	5	4	3	2	1	1	1	1	1
500	139	131	107	76	42	28	20	16	14	12	10	9	8	7	6	5	4	3	2	1	1	1	1	1
400	139	131	107	76	42	28	20	16	14	12	10	9	8	7	6	5	4	3	2	1	1	1	1	1
300	139	131	107	76	42	28	20	16	14	12	10	9	8	7	6	5	4	3	2	1	1	1	1	1
200	139	131	107	76	42	28	20	16	14	12	10	9	8	7	6	5	4	3	2	1	1	1	1	1
100	139	131	107	76	42	28	20	16	14	12	10	9	8	7	6	5	4	3	2	1	1	1	1	1
0	139	131	107	76	42	28	20	16	14	12	10	9	8	7	6	5	4	3	2	1	1	1	1	1
1600	157	133	108	79	48	29	124	204	271	327	380	447	498	531	566	522	484	464	422	400	315	249	211	170
1500	351	329	311	295	271	302	295	295	307	332	363	347	371	337	359	367	311	320	332	348	344	325	356	325
1400	60	60	60	49	80	56	5	27	48	46	15	46	14	67	15	14	113	56	47	14	17	71	19	154
1300	313	565	559	445	820	625	66	313	539	504	41	438	125	652	129	133	1313	566	500	129	145	495	164	1938
1200	91	91	61	91	41	82	21	33	57	86	197	172	152	112	221	66	91	101	88	36	91	51	51	61
1100	1938	3875	1938	5438	1500	1750	12	63	313	633	707	3750	1809	1875	5563	121	1750	1875	1313	121	2000	1750	5563	3198
1000	3	3	2	2	1	1	1	2	4	6	7	9	11	12	13	13	12	11	10	9	8	6	5	4
900	29	26	27	27	21	14	88	153	183	197	203	208	225	232	247	250	252	234	181	118	50	43	38	24
800	630	29	26	27	21	14	88	153	183	197	203	208	225	232	247	250	252	234	181	118	50	43	38	24

AD-A160 899

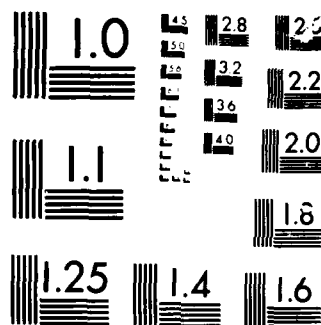
A SEMI-EMPIRICAL LOW-LATITUDE IONOSPHERIC MODEL(U) AIR 2/2
FORCE GEOPHYSICS LAB HANSCOM AFB MA
D N ANDERSON ET AL. 10 OCT 85 AFGL-TR-85-0254

UNCLASSIFIED

F/G 4/1

NL





DECEMBER SOLSTICE - SOLAR CYCLE MINIMUM ELECTRON DENSITY ($10^{-3}/\text{cc}$) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME
 LATITUDE = +0 degrees TEC - TOTAL ELECTRON CONTENT ($10^{12}/\text{cm}^2$) 630 nm 0. RECOMBINATION AIRGLOW (rayleighs)

km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
940	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
880	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
860	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
840	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
820	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
780	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
760	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
740	3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
720	4	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	5	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
680	6	6	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
660	8	8	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
640	10	10	3	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
620	12	12	4	4	3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	16	16	5	5	4	4	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
580	21	21	8	8	6	6	3	3	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0
560	26	26	11	11	8	8	5	5	3	3	2	2	1	1	0	0	0	0	0	0	0	0	0	0
540	34	34	15	15	10	10	6	6	4	4	3	3	2	2	1	1	0	0	0	0	0	0	0	0
520	43	43	20	20	13	13	8	8	5	5	4	4	3	3	2	2	1	1	0	0	0	0	0	0
500	55	55	28	28	16	16	9	9	6	6	5	5	4	4	3	3	2	2	1	1	0	0	0	0
480	71	71	37	37	21	21	12	12	8	8	6	6	5	5	4	4	3	3	2	2	1	1	0	0
460	90	90	50	50	29	29	17	17	10	10	8	8	7	7	6	6	5	5	4	4	3	3	2	2
440	115	115	65	65	39	39	22	22	13	13	10	10	9	9	8	8	7	7	6	6	5	5	4	4
420	146	146	109	109	64	64	38	38	22	22	14	14	12	12	10	10	9	9	8	8	7	7	6	6
400	183	183	139	139	84	84	53	53	30	30	18	18	15	15	12	12	10	10	9	9	8	8	7	7
380	226	226	174	174	107	107	72	72	40	40	25	25	20	20	16	16	13	13	11	11	10	10	9	9
360	275	275	216	216	133	133	97	97	54	54	34	34	28	28	22	22	18	18	15	15	14	14	13	13
340	325	325	261	261	166	166	127	127	72	72	44	44	37	37	30	30	24	24	20	20	19	19	18	18
320	367	367	300	300	186	186	152	152	93	93	55	55	45	45	38	38	31	31	26	26	25	25	24	24
300	387	387	311	311	221	221	140	140	120	120	75	75	66	66	54	54	44	44	36	36	35	35	34	34
280	357	357	273	273	210	210	111	111	92	92	79	79	68	68	56	56	45	45	37	37	36	36	35	35
260	250	250	176	176	108	108	63	63	44	44	67	67	56	56	45	45	36	36	29	29	28	28	27	27
240	103	103	61	61	20	20	18	18	10	10	31	31	24	24	19	19	15	15	12	12	11	11	10	10
220	16	16	6	6	1	1	1	1	5	5	15	15	10	10	8	8	6	6	5	5	4	4	3	3
200	0	0	0	0	0	0	0	0	2	2	28	28	18	18	13	13	10	10	8	8	7	7	6	6
180	0	0	0	0	0	0	0	0	3	3	13	13	8	8	6	6	5	5	4	4	3	3	2	2
Mmax	387	312	223	154	121	79	89	320	487	559	573	522	521	540	548	559	580	601	619	564	495	461	449	432
Hmax	299	305	269	334	306	277	275	211	283	309	344	352	353	333	347	343	345	341	355	372	368	347	333	310
AUF	45	29	111	17	20	93	102	37	38	48	37	27	133	153	99	73	72	89	58	59	59	78	47	44
CUF	574	352	1992	262	297	1938	3875	625	570	691	469	316	1988	1996	1113	738	72	1043	633	684	719	1065	563	500
AlO	31	29	50	26	51	41	50	51	71	92	132	60	60	122	108	87	92	102	58	38	37	42	37	39
Clo	348	266	3516	66	1813	1688	1957	1500	2000	1750	1938	86	176	1938	1148	750	984	1750	453	207	250	500	313	574
TEC	5	3	2	2	1	1	1	4	7	10	12	13	14	14	14	14	14	14	13	11	9	8	7	7
630	110	84	57	37	27	28	38	159	249	281	275	263	268	266	260	266	265	233	176	85	61	66	84	102

DECEMBER SOLAR CYCLE MINIMUM ELECTRON DENSITY (10¹²/cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME
 LATITUDE: +4 degrees TEC: TOTAL ELECTRON CONTENT (10¹²/cm²) 630 nm 0° RECOMBINATION AIRGLOW (rayleighs)

km	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
630	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECEMBER SOLSTICE - SOLAR CYCLE MINIMUM ELECTRON DENSITY ($10^{10.3}/\text{cc}$) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME
 LATITUDE = -8 degrees TEC - TOTAL ELECTRON CONTENT ($10^{10.12}/\text{cm}^2$) 630 nm O+ RECOMBINATION AIRGLOW (rayleighs)

DECEMBER SOLSTICE - SOLAR CYCLE MINIMUM ELECTRON DENSITY ($10^{-3}/\text{cc}$) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME
 LATITUDE = +12 degrees TEC = TOTAL ELECTRON CONTENT ($10^{-12}/\text{cm}^2$) 630 nm 0. RECOMBINATION AIRGLOW (ray heights)

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT
1900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
940	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
880	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
860	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
840	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
820	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
760	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
740	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
680	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
660	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
640	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
620	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
580	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
560	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
540	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
520	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
460	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
440	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
360	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
340	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DECEMBER SOLSTICE - SOLAR CYCLE MINIMUM ELECTRON DENSITY (10¹⁰3/cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME
(LATITUDE = +16 degrees TEC = TOTAL ELECTRON CONTENT (10¹⁰12/cm²) 630 nm 0+ RECOMBINATION AIRGLOW (Rayleighs)

km	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
261	227	170	76	20	8	12	161	241	274	405	448	522	514	495	485	431	406	350	423	416	334	326	267	
292	269	253	237	269	243	296	237	249	273	247	288	255	278	243	253	251	261	331	289	286	335	297	324	
37	68	48	47	17	48	28	5	16	38	117	88	117	142	98	313	159	153	142	36	58	58	7	43	17
563	1198	762	639	254	750	449	63	188	445	1633	1195	1938	1250	5875	2422	1938	1875	441	913	583	77	675	254	
51	41	41	40	27	41	140	41	91	32	51	32	91	68	61	52	51	45	91	61	61	61	61	61	61
1813	1598	1688	1715	39	1625	5648	1813	5438	63	1813	63	1500	820	313	1625	1938	1813	129	513	312	51	51	51	51
TEC	4	3	2	1	0	0	0	2	3	5	7	10	11	11	11	10	9	8	7	6	5	4	3	4
630	75	89	87	43	16	2	6	105	171	243	295	342	347	364	347	329	293	251	190	176	147	123	81	85

REGENER SOLTYPE - SOLAR SILENTWIN - ELECTRON DENSITY (10²³/cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME
 ALTITUDE - 300 degrees - TOTAL ELECTRON CONTENT (10¹⁶/cm²) - 630 nm 0% RECOMBINATION AIRGLOW ray paths.

[illegible]

DECEMBER SOLSTICE - SOLAR CYCLE MINIMUM ELECTRON DENSITY (10^{12} /cc) AS A FUNCTION OF HEIGHT (km) AND LOCAL TIME
 LATITUDE = 24 degrees TEC - TOTAL ELECTRON CONTENT (10^{12} /cm²) 830 nm O- RECOMBINATION AIRGLOW (ray heights)

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23 LT
1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
940	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
880	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
860	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
840	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
820	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
760	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
740	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
680	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
660	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
640	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
620	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
580	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
560	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
540	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
520	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
460	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
440	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
420	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
360	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
340	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nmax	14	11	10	6	1	0	1	100	165	225	249	291	290	275	311	286	257	213	131	94	51	28	22	18
Hmax	295	315	251	235	263	241	342	235	246	215	244	229	251	221	240	249	247	257	269	283	279	315	251	313
AUF	101	16	103	58	18	17	17	16	5	26	6	25	24	271	53	47	56	59	133	9	14	17	79	14
QUP	2000	250	2000	1000	313	254	254	250	66	313	66	254	250	5676	551	500	625	684	1938	113	176	262	1426	184
AUF	51	20	50	31	34	41	109	51	91	50	61	41	71	41	51	91	91	121	72	52	62	35	41	91
CUF	3375	15	3387	1188	125	1625	1828	3688	3688	3688	1750	1625	1813	1750	1875	3938	5438	7500	1875	551	2000	125	1750	3938
TEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
530	4	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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