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AUTHOR: (9) Fomenko, B.D.

TITLE: (6) Properties of type-M solar corpuscular streams as deduced from an analysis of their influence on the troposphere

PERIODICAL: (15) Astronomicheskii zhurnal, v. 39, 5, 1962,

pp. 833 - 839

TEXT: A statistical analysis is reported of the correlation between plages and tropospheric disturbances for the descending branch of solar activity when the relative Wolf number is in the range $15 < R < 75$. 719 plages were included in the analysis covering the period 1906 - 1952. The observational material was taken from the data on the passage of plages through the solar centre, as reported by the Sluzhba Solntsa SSSR (Solar Service, SSSR), Meudon, Coimbre, Guadalcanal and Mount Wilson observatories. A full list of the data is given in the papers of E.R. Mustel' (Astron.zh., 38, 28, 1961; 39, 813, 1962). The analysis also includes meteorological data on atmospheric pressure for Moscow, Tbilisi, Volgograd, Archangel and Omsk. The superimposed Card 1/3

epoch method is used to analyse the data. Inspection of the statistical curves shows that they all have a maximum at about $\Delta t = 6^d$ and this suggests that the maximum disturbances in the lower layers of the Earth's atmosphere occur six days after the passage of the plages through the centre of the solar disc. There are further secondary maxima to the left of the principal maximum at $\Delta t = 6$ but these are ascribed to the longitudinal distribution of plages on the Sun. It is argued that these curves indicate that type-M corpuscular streams are responsible for an increase in the pressure in the lower layers of the terrestrial atmosphere. The fact that this effect occurs in the entire atmosphere is indicated by Fig. 3, in which the statistical curves for the seven points mentioned above are given (curves 1-7, respectively). Curves 5-7 refer to night observations. In all cases, the maximum occurs at $\Delta t = 6$ days. The general conclusion is that there is a definite correlation between atmospheric disturbance and plages, that the atmospheric disturbances reach a maximum after an average interval of six

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days after the passage of the plages through the centre of the disc, that the atmospheric disturbances in the lower layers of the atmosphere are accompanied by an increase in the atmospheric pressure and that the plages are the main sources of corpuscular streams. There are 3 figures and 1 table.

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SUBMITTED: October 15, 1961