

## SHORT RANGE MODEL FOR BWS

Paul Ruscher

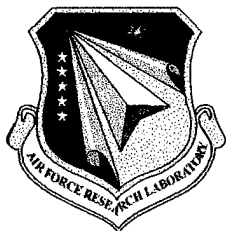
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Final Report

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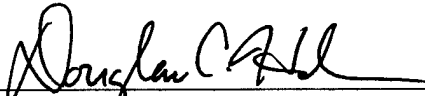
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The following summary condenses the bulk of the work performed under contract number F19628-93-K-0006 by Paul Ruscher and graduate students at the Florida State University. This constitutes the final submission under the contract.

## **Summary Findings and Conclusions**

- The 1D PBL model has been substantially improved to incorporate vertical motion from GEMPAK grid files, so that vertical advection (subsidence) realistically affects PBL growth.
- The very stable PBL has been refined to ensure correct matching under PBL transitions from one regime to another.
- The PBL model has been thoroughly tested and validated for a variety of studies, including maximum and minimum temperature and aviation forecasts.
- A new AMT model was developed using the KNMI AMT model and the Oregon State University 1D model, with changes made at Florida State University
- Problems were encountered obtaining NOGAPS grids in real time so testing had to be done using the Nested Grid Model (NGM).
- Model performance was acceptable for many simulations for coastal Gulf of Mexico locations; however it was found that the model was "too moist" in many situations, necessitating better formulations for the marine atmospheric boundary layer in the 1D model.
- Marine PBL is (was) under investigation by Oregon State University and their results were not available to us while we conducted our investigation.

Therefore the "best" marine PBL may not have been used. Persistent clouds and vigorous mixing were systematic problems noted in the thesis by Birol Kara.

- AMT modeling still provides a useful standalone independent check on three-dimensional numerical models. With improvements in computing capabilities and four dimensional assimilation, it is anticipated that the present generation of mesoscale models will have superior performance. However, their large requirements for network connectivity and disk space may preclude their use in operational settings under certain conditions. Therefore we suggest that AMT modeling, which takes into account a moving vertical column model, is still worth some effort.
- Contractor delays were due in small part to the following circumstances out of our control: (1) delays in delivery of loaned equipment to contractor; (2) failure to deliver an extra X-terminal to contractor; (3) external computer break-in from a University student in New York State, which shut down our operation for over 4 months while University, FBI and DOD completed their investigation.