TOWARDS OPERATIONAL THUNDERSTORM FORECASTING AT THE KENNEDY SPACE CENTER USING THE PARALLELIZED VERSION OF RAMS ON A WORKSTATION CLUSTER

by

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Terrain induced thunderstorms are a major forecast problem at the Kennedy Space Center. Lightning, strong winds and precipitation associated with storms triggered by east and west coast sea breezes, plus smaller cells generated by the local circulations formed by the islands on which the KSC complex is located, are a major cause of work stoppages and launch delays. Thus any techniques that can either improve the timing or localization of convective storm forecasts can significantly impact the efficiency of KSC operations. The Regional Atmospheric Modeling System (RAMS) is a non-hydrostatic, 3-D, two-way multiple-nested grid, prognostic mesoscale model that can employ either explicit or parameterized treatments for convective clouds. Its ability to predict small scale wind circulations and convective storm development in east central Florida has already been well documented. Lacking, however, has been the means to run such a code on a operational basis in support of the KSC Range Weather Office forecasting staff.

The development of a parallelized version of the RAMS code and the ongoing rapid improvements in price/performance ratios for high performance workstations have allowed for the development of PROWESS - the Parallelized RAMS Operational Weather Simulation System. Using eight clustered CPUs, PROWESS initially will be able to simulate storms on a very localized basis ($\Delta x = 1000 \text{ m}$) with a 1:1 run time/real time ratio. By the time PROWESS is ready for operational testing at the Applied Meteorology Unit at KSC (late 1995), affordable processors should be available allowing RAMS to be run in a forecast mode (4 times faster than real time). Examples of simulations will be presented. The extensive database from the 1991 CaPE Experiment are being used for initial model sensitivity testing and evaluation studies.