

Deployment and Assessment of MPAS-A at Taiwan's Central Weather Administration

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The Model for Prediction Across Scales–Atmosphere (MPAS-A) is being evaluated as a prospective next-generation regional forecast model for the Central Weather Administration (CWA) of Taiwan. Prior research has identified a persistent negative pressure bias aloft on the downstream side of south-central China during winter when the Tibetan Plateau is included within the MPAS simulation domain. This upper-level pressure anomaly may further influence springtime cyclogenesis, altering the intensity of developing systems as well as the timing of frontal passages and associated moisture transport affecting Taiwan.

To further assess MPAS-A's performance, a series of variable-resolution mesh experiments were conducted to investigate the impact of the regional modeling domain on forecast quality. Preliminary results indicate that overall model errors are substantially larger in magnitude than the variations introduced by modifying the regional domain coverage. Additionally, quantitative precipitation forecast (QPF) skill was evaluated against the current operational Weather Research and Forecasting (WRF) model. In selected 2024 afternoon thunderstorm cases over Taiwan, MPAS-A demonstrated superior QPF performance compared to WRF, regardless of differences in model configuration.

Key words : MPAS-A, variable mesh, regional modeling