

Supporting Information

A Neural-network-based Alternative Scheme to Include Nonhydrostatic Process in Dynamical Core of Atmosphere

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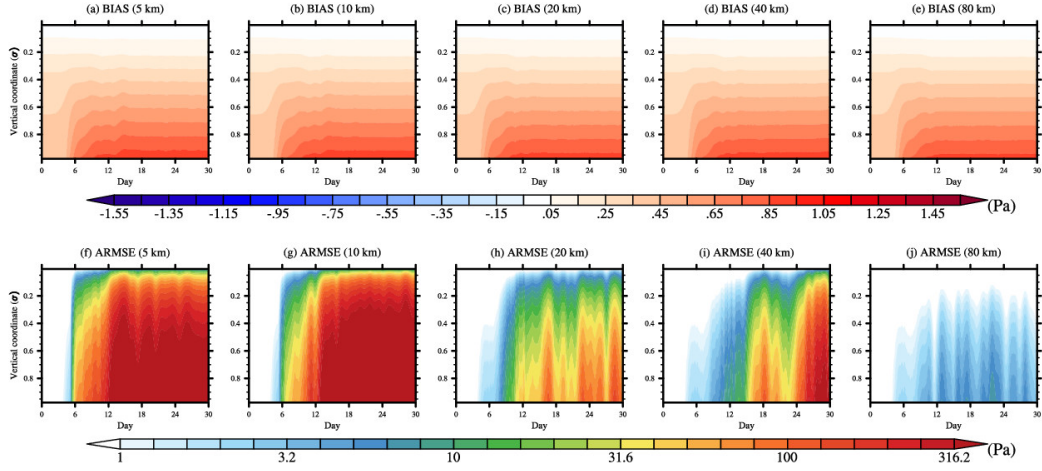


Fig. S1. Time- σ cross section of the horizontally averaged systematic biases (a - e) and anomaly root mean square errors (f – j) of pressure (Pa) in the hydrostatic solver relative to the nonhydrostatic solver in five tests at the 5km (a and f), 10km (b and g), 20km (c and h), 40km (d and i) and 80km (e and j) horizontal resolutions in the original experimental design domain of the baroclinic-wave test in the WRF idealized package, respectively. All tests adopt the same timesteps of 60s except the 5km-tests have to reduce the timestep to 30s for computational stability.

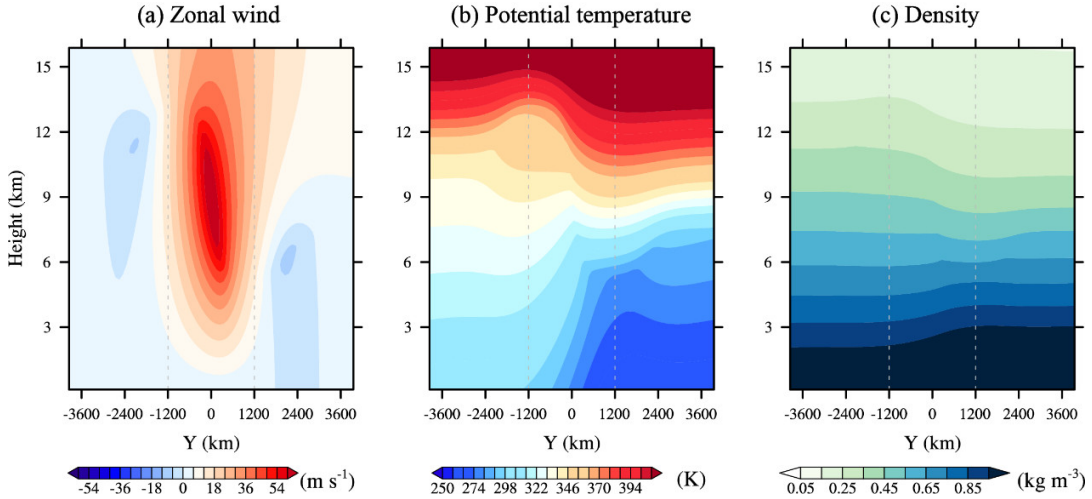


Fig. S2. Meridian-height cross of the initial state of the zonal wind (a), potential temperature (b), and density (c) of the baroclinic wave test in the original idealized package of WRF. The two parallel dashed grey lines in each subfigure mark the meridional range of the reduction domain.

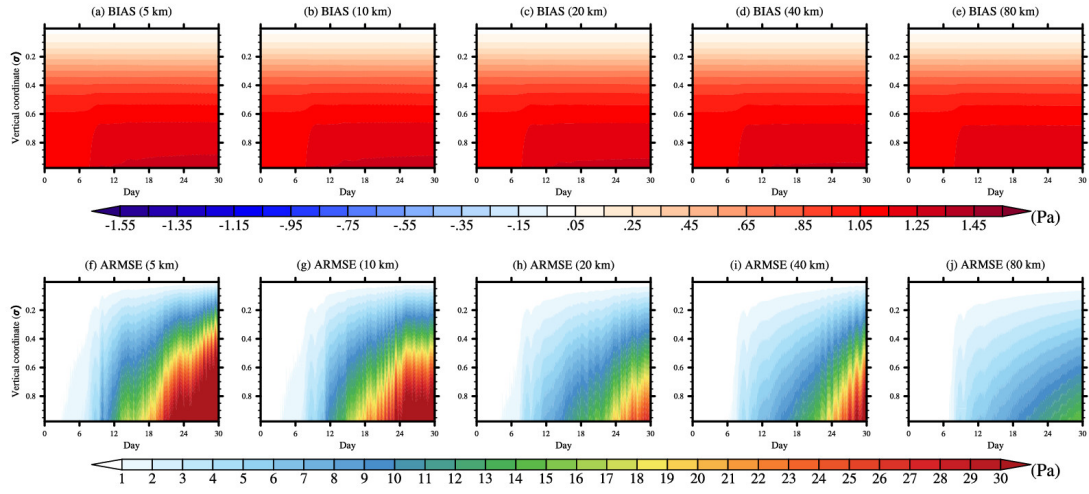


Fig. S3. Same as Fig. S1 but for the tests at the reduced domain (2000km \times 2400km).