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Supplement of

A deep-atmosphere extension in a nonhydrostatic dynamical core: formulation and idealized tests

Qitao Cui et al.

Correspondence to: Li Dong (dongli@lasg.iap.ac.cn)

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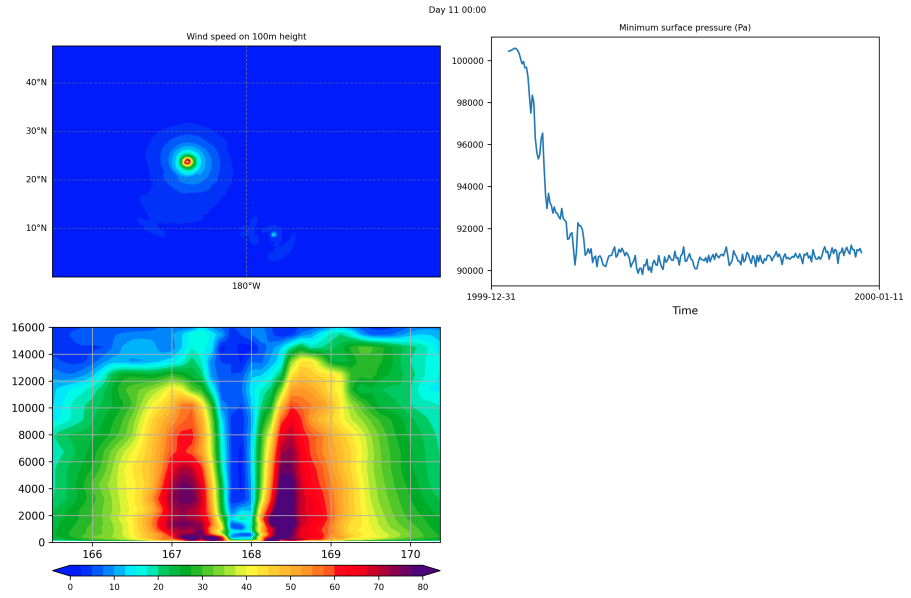


Figure S1. Wind speed horizontal profile (100m) and vertical profile at day 10 and minimum surface pressure time series of Fig3a's NHS case

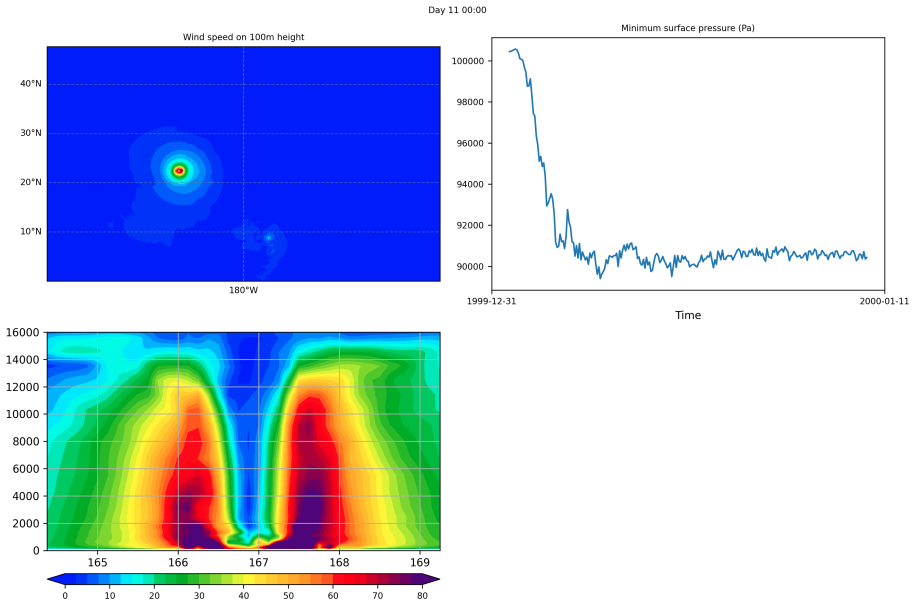


Figure S2. As in FigS1, but for Fig3a's NHD case

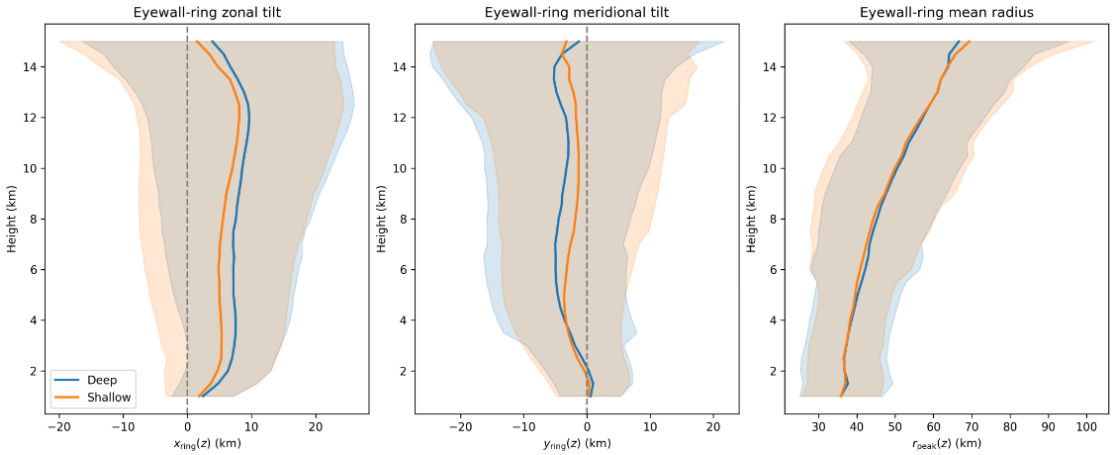


Figure S3. Vertical structure of the eyewall-ring tilt in the deep- and shallow-atmosphere simulations of Fig3a's case. The left, middle, and right panels show the height-dependent zonal displacement, meridional displacement, and mean eyewall-ring radius, respectively. The curves denote the time-mean diagnostics for the deep- and shallow-atmosphere experiments, while the shaded regions indicate the temporal variability. The dashed vertical line marks zero displacement relative to the storm center. Positive x indicates an eastward offset, and positive y indicates a northward offset. This figure compares the vertical tilt and radial structure of the eyewall updraft ring between the two dynamical configurations.

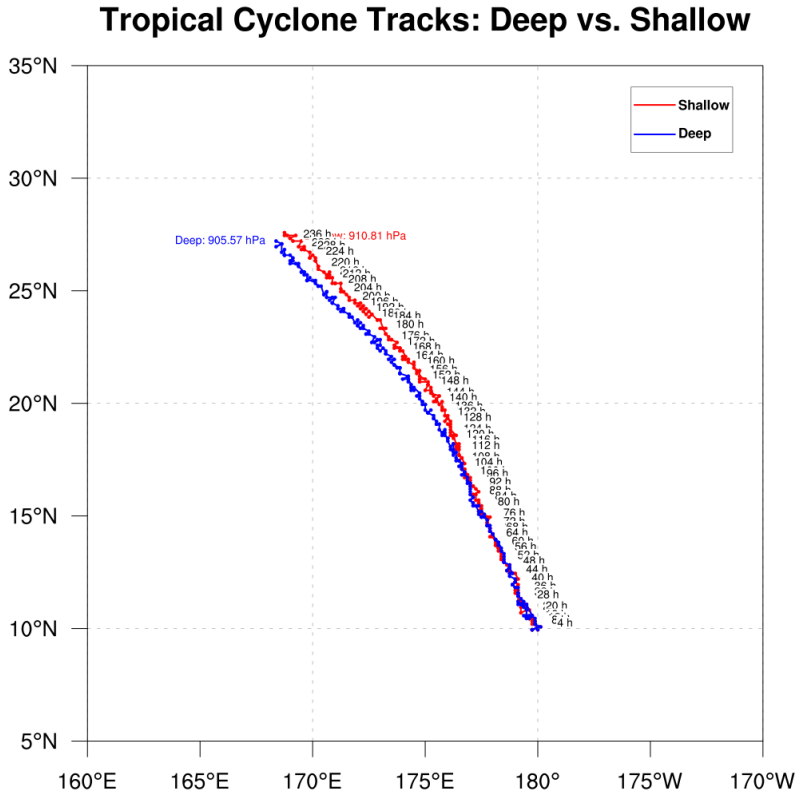


Figure S4. The tropical cyclone tracks comparison of NHD(blue) and NHS(shallow) , the perturbation latitude is at 10°N and the output interval is one hour.