



## A Dynamical Initialization Scheme for Tropical Cyclones under the Influence of Terrain

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## Method

- SINT1: DX > 450 km, the same as general DI scheme (white);
- SINT2: 150 km < DX < 450 km & H < 1 km, remove topo-variable before vortex separation (light gray);</p>
- SINT3: DX <150 km, or 150 km < DX < 300 km & H > 1 km, semi-idealized integration without the terrain is used to deepen the vortex (dark gray).

DX is the distance between the TC center and the terrain, H is the maximum height of the terrain.





(a): Scalar variable from the WRF model (merged with meteorological data and the terrain);

(b): Global analysis (without high resolution topographic data);

(c): Wavelengths less than 200 km have been removed from (b);

(d): The difference between (a) and (c), defined as topo-variable.

## Result



Temporal evolution of absolute position (a, c, e, g) and intensity (b, d, f, h) errors for 9 TCs affected by terrains over the western North Pacific in 2015 in the hindcasts from CTRL (red dashed) and DI runs (black solid), and official forecasts from CMA (blue dashed) and JTWC (green dashed), as well as from HWRF model (yellow dashed): (a) and (b) for total cases, (c) and (d) for SINT1 cases, (e) and (f) for SINT2 cases, and (g) and (h) for SINT3 cases.

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