Effects of inferring unobserved Thermospheric and Ionospheric states variable by using Ensemble Kalman filter to assimilate synthetic FORMOSAT-3/COSMIC data on global Ionospheric Specification and Forecasting

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Results:

1. By including unobserved thermospheric variables into the state vector of the EnKF assimilation system, the accuracy of ionospheric analysis and forecast is improved.
2. The impact of updating neutral composition important on the ionospheric specification.
3. Initialization of both thermospheric and ionospheric state variables impacts the ionospheric forecast for more than 12 hours.

TIEGCM

FORMOSAT-3/COSMIC

The synthetic electron density data are sampled from “true” state under the geometry of FORMOSAT-3/COSMIC

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