Status and Preliminary Evaluation for Chinese Re-Analysis Datasets

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Based on operational T639L60 spectral model, combined with Hybird_GSI assimilation system by using meteorological observations including radiosondes, buoyes, satellites el al., a set of Chinese Re-Analysis (CRA) datasets is developing by Chinese National Meteorological Information Center (NMIC) of Chinese Meteorological Administration (CMA). The datasets are run at 30km (0.28°latitude / longitude) resolution which holds higher resolution than most of the existing reanalysis dataset. The reanalysis is done in an effort to enhance the accuracy of historical synoptic analysis and aid to find out detailed investigation of various weather and climate systems.

The current status of reanalysis is in a stage of preliminary experimental analysis. One-year forecast data during Jun 2013 and May 2014 has been simulated and used in synoptic and climate evaluation. We first examine the model prediction ability with the new assimilation system, and find out that it represents significant improvement in Northern and Southern hemisphere, due to addition of new satellite data, compared with operational T639L60 model, the effect of upper-level prediction is improved obviously and overall prediction stability is enhanced. In climatological analysis, compared with ERA-40, NCEP/NCAR and NCEP/DOE reanalyses, the results show that surface temperature simulates a bit lower in land and higher over ocean, 850-hPa specific humidity reflects weakened anomaly and the zonal wind value anomaly is focus on equatorial tropics. Meanwhile, the reanalysis dataset shows good ability for various climate index, such as subtropical high index, ESMI (East-Asia subtropical Summer Monsoon Index) et al., especially for the Indian and western North Pacific monsoon index.

Latter we will further improve the assimilation system and dynamical simulating performance, and obtain 40-years (1979-2018) reanalysis datasets. It will provide a more comprehensive analysis for synoptic and climate diagnosis.