Application of Bias Correction Products of GRAPES_3KM Model in Pyeongchang Olympic Winter Games

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The 23rd Olympic Winter Games and the 13th Winter Paralympics hold in Pyeongchang, Korea on February 9-25, 2018 and March 18-18, 2018. ICE-POP 2018 (International Collaborative Experiments for Pyeongchang 2018 Olympic and Paralympic winter games［U+FF09］was organized by Korea Meteorological Administration and Numerical Model Center in order to study the forecasting ability of convective scale model to high-impact weather system under complex terrain and to supporting weather forecast and meteorological services during the Winter Olympics.

CMA participated in the experiments based on the high resolution model GRAPES_3KM by providing the direct model output and bias correction products at the specific stations using the method of Kalman filter temporal errors(correction is updated with most recent errors) . The 0-24h hourly direct model output grid data and the calibration products were provided twice a day(00 and 12UTC). Site products (corrected) included 2m temperature, 2m relative humidity, 10m wind speed, 10m wind direction, 10m U wind, 10m V wind.

The verification and evaluation were done, and the results shown that the high resolution GRAPES_3KM model has the good abilities to simulate the surface parameters and precipitation at complex terrain and bias correction technology makes the products better and effective. Compared with observations and other models, the corrected wind speed and wind direction products are better and root mean square error were decrease obviously, the temperature products had better results too. Especially for calibrated wind forecasting, almost all stations, all time, and all forecasting length are better than the other two modes. But temperature and humidity are not superior in despite of they were improved after the calibration, this was related to the strong bias of the model . For the simulation of precipitation, the rainfall distribution was better overall although this model was limited by the coarser resolution that we can't simulate more details.

Through studying the appreciated method of obtaining bias correction coefficient, the filter method is improved and the forecasts of the competition venues such as 2m temperature and 10m wind are improved accordingly, and it is the effective way to do high resolution meteorological parameter forecasts and services.