

P24 Development of WRF-RTFDDA based high-resolution realtime microscale weather analysis and forecasting system for Shenzhen, China

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Shenzhen is a major city located in the Pearl River Delta in southern China. The municipality covers an area of 2,050 square kilometers including urban and rural areas. In order to improve the weather service to the city, Meteorological Bureau of ShenZhen Municipality (SZMB) has implemented a high-density observation-network with advanced remote sensing instruments in the Shenzhen metropolitan and surrounding regions. The observation system includes ultra-dense surface Automatic Weather Station (AWS), wind profilers, radiometers, met-towers, Doppler radars, the Global Positioning System (GPS), lightning, and other platforms. These observational systems/networks provide unique ultra-high spatiotemporal resolution observations for leveraging urban-scale numerical weather prediction. Toward this end, the NCAR/RAL WRF-based RTFDDA (Realtime Four Dimensional Data Assimilation) forecasting system has been deployed at SZMB and configured for the Shenzhen area. The modeling system contains four nested domains with horizontal grid sizes at 27km, 9km, 3km and 1 km, respectively. The 1km domain covers the Shenzhen municipality, Hong Kong, and neighboring areas. The system has been running in realtime to provide continuous weather analysis and forecast, with assimilation of the SZMB high-density observations. At the workshop, we will describe the model system and the data, emphasizing the impact of the data, an effective data quality control, and the research to customize WRF physical schemes according to the regional/local urban, complex land-sea forcing and the hilly terrain characteristics. In particular, impact and adjustment to Jimenez' correction to surface layer momentum flux to improve surface wind prediction will be discussed. Results based on case studies and real-time forecasting will be presented to illustrate the importance of WRF system optimization for a given region.