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**Merging satellite data with a 4DVAR data assimilation system to reconstruct the high resolution 3D meteorological fields in Taiwan and vicinity**

**摘要**

The Variational Doppler Radar Analysis System (VDRAS) has been updated with implementations of ice phase microphysics (Chang et al. 2015), terrain-resolving (Tai et al. 2017) and surface assimilation schemes (Chen 2016), which makes VDRAS a powerful tool for convective-scale analysis and nowcasting. However, the lack of observation at sea surface can significantly degrade the performance of analysis and even short-term forecast. Hence, in this study, the implemented surface assimilation scheme is enhanced by additional assimilation of sea surface wind data retrieved by satellite observation.

The sea surface wind data selected here is provided by Advanced Scatterometer Data (ASCAT). The ASCAT wind data is retrieved from satellite’s microwave channel at 10 m height above sea surface with 12.5 km resolution. Prior to the assimilation, a bias correction method has been applied with reference of buoy data.

The real case study is conducted to investigate the feasibility of the enhanced surface assimilation scheme. Promising results are shown in the analysis. The low-level convergence line due to confluence of land breeze and southwesterly flow is well reproduced. The enhanced southwesterly on sea surface and significant reduction of inland wind speed are successfully analyzed with the modified satellite data assimilation scheme.

**關鍵字**

Variational Doppler Radar Analysis System (VDRAS)

Advanced scatterometer (ASCAT).