Impact of the Surface Data Assimilation on the Afternoon Thunderstorm Prediction in Taiwan

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Abstract

Taiwan, a relatively small subtropical island, has regions extending above 3000 m within a distance of 50 km. The local circulation is prominent due to the topographic effect and the contrast of the land/sea and mountain/valley. Furthermore, the rainfall system, in particular for the afternoon thunderstorm, over the island was significantly modulated by the local circulation.

In this study, a continuous afternoon thunderstorm cases in 29 June-8 July 2017 were selected to demonstrate the impact of the surface data assimilation on the prediction of the rainfall systems.

The results show that the 3DVAR system significantly outperforms the NODA run and is able to well present the afternoon thunderstorm rainfall system. In particular, the assimilation of the surface and radar observation has the best performance.