

Dense precipitation radar data assimilation
with an ensemble Kalman filter:
an observing system simulation experiment for a typhoon case

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Abstract

Precipitation radar observations have been playing an important role in meteorology through providing valuable information such as precipitation nowcast. Recently, such observations started to be used in the field of numerical weather prediction. Previous studies showed some success in data assimilation of radar reflectivity for convective-scale and tropical cyclone analyses. Nevertheless, it is still difficult to build a general approach to data assimilation of radar reflectivity due to various factors such as the non-diagonal observation error covariance matrix, complex observation operator, and strong nonlinearity and model errors in the moist physical processes. In this study, we aim to develop a method to effectively assimilate radar reflectivity data. We perform an observing system simulation experiment, in which we assume that reflectivity data are available at all model grid points, using the SCALE-LETKF system (Lien et al., 2017) and a satellite simulator known as the Joint-Simulator (Hashino et al., 2013). As the first step, we focus on a case of Typhoon Soudelor (2015), the strongest typhoon in the West Pacific in 2015. In the presentation, we will show the impact of dense radar observations on the analyses and forecasts of Typhoon Soudelor.

References:

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