

Dense precipitation radar data assimilation: an observing system simulation

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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. As the first step, we focus on the case of Typhoon Soudelor (2015), which was the strongest typhoon in the West Pacific in 2015. In the presentation, we will report the impact of dense radar observations on the analyses and forecasts of Typhoon Soudelor.

Keywords: numerical weather prediction, tropical cyclone, radar reflectivity, data assimilation