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A method to improve the simulation of a squall line case by assimilating radar reflectivity data

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Radar reflectivity data is crucial to improve initial field of numerical model. However, the method of Ensemble Kalman Filtering (EnKF) can not directly assimilate radar reflectivity data. We explore a method of modifying the initial thermodynamic field of numerical model by using radar reflectivity data.
Two experiments are carried out to reveal the forecast improvement of a squall line occurred in the Eastern China by assimilating reflectivity data. One experiment is assimilating some observational data without radar reflectivity data using EnKF method (hereafter called No-Ref experiment), and the other is modifying the initial thermodynamic field using radar reflectivity data after conducting EnKF experiment (called Ref experiment). Compared with the simulation results of No-Ref experiment, the forecast is improved in Ref experiment. The results show that thermodynamic field adjustment leads to the adjustment of the dynamic field, and plays an important role in the improvement of squall line forecast.