Assimilation of Sea Surface Wind by Synthetic Aperture Radar in Typhoon Cases

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To improve the accuracy of typhoon forecasts, it is necessary to improve the accuracy of the initial condition in addition to the accuracy of the numerical weather forecast model. In this study, we investigate the impact of the accuracy of the sea surface wind in the initial conditions of the model on the typhoon forecast. An effective observation that can capture detailed sea surface winds around a typhoon is the satellite-borne synthetic aperture radar. In the typhoon case, we assimilated the sea surface wind speed observed by the synthetic aperture radar. The assimilation method used was the four-dimensional variational method using ASUCA-Var, which is operated by the Japan Meteorological Agency. Since the characteristics of observation change between strong and weak winds, the bias correction amount and the observation error variance depending on the wind speed were obtained and used in the assimilation. Additionally, the variational quality control with the Huber loss function was adopted to make effective use of the observed data in strong wind conditions. As a result of the assimilation experiment, the typhoon intensity and path were slightly improved and the wind speed prediction was improved. In my presentation, I would like to show the impact of assimilation on forecasting, including a comparison between simulations and GPM satellite observations.