

Multivariate Background Errors for 3DVar Cloud Analysis.

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The specification of the model background error statistics is a key component to data assimilation, since it conditions the impact that observations will have on the analysis. Classically, variational methods represent covariances for wind, temperature, pressure and humidity through a statistical model. However, data assimilation of clouds remains a challenge. In this study, cloud hydrometeors are included as control variables and their background errors are represented through a multivariate approach. They are directly assimilated with a 3DVAR technique using all-sky radiance data from different satellite instruments (e.g. IASI, AIRS, GOES-sounder). Sensitivity tests are conducted for a real case study using the Weather Research Forecast Data Assimilation (WRFDA) system over the CONUS domain to estimate the impact a multivariate background errors on the forecast. Results indicate that significant improvements are observed in the forecast until 3 hours.
