



On the use of simulations with a “perfect” model in the error analysis of data assimilation systems

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Simulations with a known “truth” (taken from a free model run) were used to study the ability of the data assimilation system to control the growth of the forecast errors. The results of the experiments with the CMAM-DAS (Canadian Middle Atmosphere Model-Data Assimilation System) will be shown. The observations (from radiosonds, aircrafts, surface and satellites) were simulated at locations of actual measurements. Forecasts resulting from the assimilation of such simulated observations are compared to the “truth” and error statistics are then calculated. The results may be helpful in the following ways: a) this is an independent approach to the estimation of error covariances when, in contrast to other methods, we actually know the “truth”, and b) it allows to investigate the sensitivity of the assimilation to its different components in isolation [model, observations (variances, bias, type and distribution), assimilation system components (variational methods, the minimization scheme, background error covariances)].