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The NASA GEOS-5 Data Assimilation System: Preliminary results

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The NASA/Global Modeling and Assimilation Office (GMAO) is in the process of upgrading the atmospheric general circulation model (AGCM) and analysis system components of its atmospheric data assimilation system (DAS). The current GEOS-4 AGCM is being replaced with the GEOS-5 ESMF-compliant-GCM which includes the Lin and Rood (1998: Proc. of The Rossby-100 Symp., Stockholm, Sweden) finite-volume dynamical core, a new set of physics packages implemented as ESMF gridded components, and the ESMF-compliant catchment land surface model of R. Koster et al. (personal comm.). The Physical-space Statistical Analysis System (PSAS; Cohn et al. 1998, Mon. Wea. Rev. 126, 2913-2926) of GEOS-4 is being upgraded to the Grid-point Statistical Interpolation (GSI) analysis system through a collaboration between NCEP and GMAO. One of the main differences between GSI and PSAS is the direct assimilation of radiances by the former versus the assimilation of observation retrievals by the latter. This integration of GEOS-5 GCM with GSI comprises the GEOS-5 DAS, which has been operating in a pre-operational test phase, in parallel with the operational GEOS-4 system.

This presentation will discuss the many steps taken along the way to upgrade GEOS-4 to GEOS-5. Performance results of GEOS-5 will be shown, including results with AIRS and MODIS winds, and future applications will be discussed.