



RETROSPECTIVE DATA ASSIMILATION FOR GEOS-4

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The NASA/Goddard Earth Observing System 3 (GEOS-3) has recently been replaced operationally by GEOS-4. One of the major components of the new system is the finite-volume general circulation model (GCM) of Lin and Rood (1998; Proc. of The Rossby-100 Symp., Stockholm, Sweden). Updating the GEOS-3 retrospective data assimilation system of Zhu et al. (2002; Mon. Wea. Rev., submitted) to GEOS-4 requires two main steps: (i) developing the adjoint of the finite-volume GCM; and (ii) developing the adjoint of the procedures interfacing the GCM with the Physical-space Statistical Analysis System (Cohn et al. 1998; Mon. Wea. Rev. 126, 2913-2926). These required adjoints are being developed automatically through the use of the Transformation of Algorithms in Fortran compiler of Giering and Kaminski (1998; ACM Trans. Math. Software, 24, 437-474). In this presentation we discuss the current status of development and plans for the near future as well as show preliminary results.