Geophysical Research Abstracts, Vol. 9, 10051, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-10051

Boundary layer parameterizations in GEOS-5 GCM verified with GLAS observations

C. Tassone (1), J. Bacmeister (2), S. Palm (3)
(1) SAIC, (2) UMBC/GEST, (3) SSAI

The next-generation GEOS-5 data assimilation system developed by NASA's Global Modeling and Assimilation Office contains several new components. One of these is the GEOS-5 model, a general circulation model based on the flux-form semi-Lagrangian dynamical core by Lin and Rood, combined with a new physics parameterization package. The physics part of the model in particular is undergoing continued development and tuning. In the initial version of the model, the boundary layer parameterization was based on a simplified version of the Lock scheme (Lock et al 2000) with the modification that the non-local term in the equation for the temperature flux is neglected. Several prognostic quantities - e.g. precipitation rates, low-level cloud distribution and cloud height - are highly dependent on the boundary layer parameterization used. Tests have been carried out comparing cloud heights cloud distribution and PBL height over the ocean with Lidar measurements from GLAS and with radiosonde data over land. Results of these comparisons are used as a guideline to implement an improved version of the Lock scheme that includes the use of a more appropriate turbulent velocity scale and a term representing non-local fluxes of heat and moisture. These changes are expected to provide a more realistic representation of the boundary layer and thereby indirectly also of other related model variables.