



## **Analysis of clouds and radiation in the Met Office Numerical Weather Prediction model using preliminary data from the Geostationary Earth Radiation Budget**

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Preliminary data from the Geostationary Earth Radiation Budget (GERB) instrument are used to evaluate clouds and radiation simulated by the Met Office global Numerical Weather Prediction (NWP) model. Firstly, the quality of the GERB data is assessed using measurements from the Clouds and the Earth's Radiant Energy System (CERES) instrument. Monthly mean GERB data is approximately 2% lower than corresponding data CERES while GERB shortwave fluxes are found to be of order 10% larger than CERES data.

Comparisons of instantaneous collocated model and GERB data reveal a variety of model errors. A large discrepancy in outgoing longwave radiation over the west Sahara of up to  $50 \text{ Wm}^{-2}$  in July 2004 is explained mainly by clear-sky situations and attributed to high mineral dust loadings not included in the NWP model. Differences in shortwave albedo over the Sahara are reduced in the model by increasing the surface albedo to more realistic levels. Deficiencies in model cloud are identified over equatorial regions, convection over land and low altitude cloud over the oceans. Stratocumulus-like cloud and its variability is identified in both the model and GERB; the observed distribution and variability are captured by the model. However, the simulated cloud is too reflective. First estimates of variability in the radiation budget over the Africa-Atlantic region for the period 2003-2006 are presented for the model and GERB.