Geophysical Research Abstracts,
Vol. 11, EGU2009-2679, 2009
EGU General Assembly 2009

The rotated EOF analysis of convective cloud fraction over the Indian monsoon region

A. Devasthale (1), K.-G. Karlsson (1), J. Quaas (2), and H. Grassl (2)

(1) Swedish Meteorological and Hydrological Institute, Research and Development Department, Norrköping, Sweden (Abhay.Devasthale@smhi.se), (2) Max Planck Institute for Meteorology, Hamburg, Germany

The convective clouds play a major role in the regional hydrological cycle over the Indian monsoon region. The data from AVHRR sensors onboard series of NOAA satellites provide useful information on the spatio-temporal distribution and the variability of convective clouds during summer monsoons at very high resolution. Here, we apply rotated empirical orthogonal functions (EOFs) on the AVHRR data of June, July, August, and September months of years from 1982 to 2006 (25-years) over the Indian subcontinent. The purpose is twofold. 1) To identify the dominant modes of variability in the convective cloud fraction during monsoon seasons, and 2) to judge the applicability of rotated EOFs in identifying and correcting for the influence of the orbital drift of NOAA satellites, which might introduce spurious trend in the climatological time series of cloud fraction. The preliminary results show that, for very deep convective clouds, the first and third modes are heavily influenced by the orbital drift, while the second mode matches closely with the total accumulated rainfall pattern during monsoon. The rotated EOF technique shows promising results in correcting the orbital drift effect. The latter result has a special significance in the context of using AVHRR data to assess trends and variability in convective cloud fraction for climate monitoring purposes.