Geophysical Research Abstracts
Vol. 12, EGU2010-7246, 2010
EGU General Assembly 2010

Regime behaviour in the Asian summer monsoon in the late 20th century

Andrew Turner (1), Abdel Hannachi (2), and Tim Woollings (2)

(1) NCAS-Climate, University of Reading, Reading, United Kingdom (a.g.turner@rdg.ac.uk), (2) Department of Meteorology, University of Reading, United Kingdom

In this study we explore predictability issues relating the seasonal mean monsoon and its intraseasonal components. An index of monsoon convection over South and Southeast Asia is generated from the projection of the leading mode of monthly variability in June to September outgoing longwave radiation (OLR) onto daily data from the ERA-40 reanalysis. The distribution of this index is significantly negatively skewed, suggesting regime-like behaviour. A Gaussian mixture model is then applied to the daily timeseries and shows the existence of two significant regimes in monsoon convection. These reflect different phases of the quadrupole pattern over South and Southeast Asia, which can be associated with active and break events over India.

Simple trend analysis over the 1958-2001 period shows that the first regime has become less frequent and weaker while the second begins to dominate during the later period, relating to changes in the mean state. By stratifying the data according to a large-scale dynamical index of monsoon interannual variability, we show the occurrence of the regimes to be strongly perturbed by the seasonal condition, suggesting that such large-scale conditions could be used to infer likelihood of intraseasonal variability. This technique could also be used to examine changes in monsoon behaviour over centennial-scale model integrations.