



## Multidecadal variability of South and East Asian Monsoons in CMIP5 Climate Models

B. Preethi (1), M. Mujumdar (2), and R. H. Kripalani (3)

(1) Indian Institute of Tropical Meteorology (IITM), Pune, India (preethi@tropmet.res.in), (2) IITM, Pune, India (mujum@tropmet.res.in), (3) International CLIVAR Monsoon Project Office, IITM, Pune, India (krip@tropmet.res.in)

South and East Asian monsoons are two interactive subsystems of Asian monsoon. Both the South and East Asian summer (June through September) monsoon rainfall exhibit variability on a variety of time scales. Interestingly, a contrasting behaviour of South and East Asian summer monsoon rainfall is observed during last few decades, with significant decreasing trend over South Asia (particularly over northern parts of India) and increasing trend over East Asia (particularly over Korea-Japan and South China). Incidentally, the summer monsoon rainfall over southern part of India exhibits an increasing trend whereas North China experiences a decreasing trend in rainfall. Detailed analysis, for post 1970 period, indicate that the entire monsoon flow have shifted westwards, with the low pressure monsoon trough over South Asia by about 2-3 degrees of longitudes and the North Pacific Subtropical High (NPSH) over East Asia by about 5-7 degrees of longitudes. Warming of west Indian Ocean and west Pacific Ocean appear to have significant influence on the recent trends. Outputs from Coupled Model Inter-comparison Project Phase 5 (CMIP5), historical simulations (1861-2005) and future projections (2005-2100) under RCP4.5 scenario, are examined to understand the capability of the CMIP5 models in simulating the contrasting trends and also to investigate the probable future changes in the Asian monsoon subsystems. The study suggest that, in spite of large spread among the models, the future projections of summer monsoon rainfall over South as well as East Asia indicate a multidecadal variability, displaying certain epochs of more rainfall over South Asia than over East Asia and vice versa. Teleconnections between the South and East Asian monsoon rainfall also exhibits a multidecadal variability with alternate epochs of strengthening and weakening relationship. Furthermore, the large-scale circulation features such as monsoon trough over South Asia and NPSH over East Asia depict an oscillatory behaviour with east-west-east shifts, probably suggesting that the recent trends could be part of a multidecadal variability in Asian monsoon.