

Intraseasonal Variability of Air Sea Interaction Over the Indian Ocean and Its Influence on Regional and Intraseasonal Variability of the Indian Monsoon

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Intraseasonal variability of air sea interaction over the Indian Ocean and its influence on the regional and subseasonal variability of Indian monsoon is evaluated in this study. This study shows the necessity for taking into account the spatial variability of Indian monsoon and does a regional study, instead of analyzing All Indian Rainfall (AIR) alone. Precipitation over the Western Ghats (WG) in the southwest coast of India and the Ganges-Mahanadi Basin (GB) in the northeast India are studied here as they are found to be the regions of maximum precipitation with marked variability. Arabian Sea and Bay of Bengal lying on the either sides of the Indian subcontinent are analyzed and compared for its association with these regions of maximum precipitation variability. Sea surface temperature (SST), surface winds, surface latent heat flux (SLHF) and outgoing longwave radiation (OLR) over the north Indian Ocean and precipitation over the Indian subcontinent are analyzed to characterize the intraseasonal variability during the period 1998-2002. Intraseasonal variability of monsoon over WG is found to have significant correlations with intraseasonal variability of air sea interaction over Arabian Sea. Meanwhile, correlation is weak between GB monsoon intraseasonal variability and Bay of Bengal intraseasonal variability. Active and break phases of monsoon are defined as periods of above and below normal rainfall. Composite evolution of the active/break phases of precipitation over WG and GB are studied with respect to air sea interaction over the Arabian Sea and Bay of Bengal. Significant and contrasting roles played out by these surrounding oceans over the different regions are analyzed. The study reveals that air sea interaction over Arabian Sea influences precipitation at both the WG and GB regions while Bay of Bengal influences only part of the precipitation over the GB region. Arabian Sea acts as an active moisture contributor during a WG active phase and then the precipitation band moves northeastward over the Indian subcontinent and combines with the convection bands from Bay of Bengal, enhancing the GB active phase. We find that, on intraseasonal timescales, air sea interaction over Arabian Sea has a significant role in regulating the precipitation over the Indian subcontinent whereas the role of Bay of Bengal is less.