

Asymmetric response of Indian summer monsoon rainfall to opposite phases of IOD

*Swadhin Behera¹, J.V. Ratnam¹

1. Climate Variation Predictability and Applicability Research Group, Application Laboratory, JAMSTEC, 3173-25 Showa-machi, Yokohama 236-0001

The Indian summer monsoon rainfall (ISMR), that affect for than a billion human beings, is historically shown to be associated with the climate phenomenon El Niño/Southern Oscillation (ENSO). In recent times, the ISMR-ENSO link is shown to be influenced by the Indian Ocean dipole (IOD). The positive IOD (pIOD) is shown to be associated with a tripolar pattern in rainfall anomalies with above normal rainfall in central parts of India and below normal rainfall to north and south of it. However, the role of negative IOD (nIOD) in the ISMR variability is not studied and understood. In this study we have shown that the nIOD link to ISMR is not necessarily exactly opposite of that of pIOD. It is found that the nIOD is associated with a zonal dipole having above (below) normal rainfall on the western (eastern) half of the country. This asymmetry in the spatial distribution of the IOD responses arises from the differences in the atmospheric responses to opposite phases of IOD and the associated differences in moisture transports to the subcontinent.