

Characteristics of the ENSO in the Indian Ocean

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El Nino-Southern Oscillation (ENSO) is a coupled ocean-atmosphere phenomenon that has world-wide impacts on climate. In order to understand the physical mechanism of the ENSO in the Indian Ocean, Sea Surface Temperature (SST), Outgoing Longwave Radiation (OLR) and the Southern Oscillation Index (SOI) were analysed with special reference to 1997/98 ENSO.

Western Pacific warm pool revealed that instead of cool conditions during the ENSO period there were warming trends on different temporal scales. SST anomaly over the central Indian Ocean was noticeably high during the 1997/98 ENSO episode. During July 1997, SST anomaly around Sri Lanka was over 1.3°C and the values were over 0.8°C in most of the Indian Ocean. However, OLR was above normal and the rainfall over Sri Lanka was well below normal. Nevertheless during October-November and December, at the peak of El-Nino, SST around Sri Lanka was 1.3°C above normal and the rainfall was abnormally high.

The ENSO signal over the Indian Ocean has a small spatial and time scale as compared to the global ENSO phenomenon initiated in the Pacific Ocean. During ENSO, the subsidence branch of the ENSO cell is located in the Western Pacific-Indian Ocean and the convective activity over the Sri Lankan region is at a minimum.

This study reveals that SST in the Indian Ocean has a strong short-term variability, which leads to convective activity on a different spatial/time scale as compared to ENSO. During November-December, at the peak of ENSO, some regions in the Indian Ocean record exceptionally high SST and the associated convective activity produces heavy rainfall over Sri Lanka. A regional scale Physical/Dynamical model, which could explain these features in the Indian Ocean, is proposed.