



On the recent warming of the Indian Ocean

Abish Bose (1), Annalisa Cherchi (2), Satyaban Ratna (3,4)

(1) Nansen Environmental Research Centre, Kochi, India (abishb@gmail.com), (2) Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici, and Istituto Nazionale di Geofisica e Vulcanologia, Bologna, Italy, (3) Application Laboratory, Japan Agency for Marine-Earth Science and Technology, Yokohama, Japan, (4) Climatic Research Unit, School of Environmental Sciences, University of East Anglia, Norwich, UK

The recent Indian Ocean (IO) warming and its relation with the El Niño Southern Oscillation (ENSO) is investigated using available ocean and atmospheric reanalyses. By comparing the events before and after 1976, which is identified as a threshold separating earlier and recent decades with respect to global warming trends, indicates that the IO had experienced a distinct change in the warming pattern. After 1976, during the boreal summer season the cold anomalies in the IO were replaced by warm anomalies in both warm (El Niño) and cold (La Niña) ENSO events. Strong sinking by upper level winds and the associated anomalous equatorial easterly winds created favourable conditions for the IO warming from 90°E towards the western IO. Our study highlights that after 1976, atmospheric and oceanic fields changed mostly during La Niña, with both ENSO phases contributing to the warming of the IO. Warm anomalies of 0.2 °C are seen over large areas of the IO in the post-1976 La Niña composites. Our analysis suggests that the IO warming during La Niña events after 1976 may have a relation to the warm anomalies persisting from the preceding strong El Niño events.