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Air-Sea Interaction Processes Over Indian Ocean During Contrasting Monsoon Activity Over Indian Subcontinent

RAMESH KUMAR MADATHIPARAMBIL [1], SYAM SANKAR[1]

[1] *National Institute of Oceanography, Dona Paula, Goa, India*

The air-sea interaction processes over the Indian Ocean are studied using data from the Tropical Rainfall Measuring Mission (TRMM) satellite for two recent contrasting monsoon years, namely 2002 (deficit) and 2005 (normal). The role of various air-sea interaction parameters, such as sea surface temperature, wind speed, precipitable water, precipitation and cloud liquid water were further examined for different study areas namely a) Arabian Sea b) Bay of Bengal c) South China Sea and d) Southern Indian Ocean during the monsoon season. Decreased precipitable water in the Arabian Sea from the July to September could have resulted in decreased rainfall activity over the subcontinent in 2002. The moisture transport into the three sections a) northern part of Indian subcontinent ($15^{c}irc$-$25^{c}irc$N) b) southern part of subcontinent ($5^{c}irc$-$15^{c}irc$N) and c) equatorial region ($5^{c}irc$S-$5^{c}irc$N) along $75^{c}irc$E have been computed by vertically integrating the values of horizontal water vapour flux from 1000 hPa to 300 hPa, using data from the National Centre for Environmental Prediction (NCEP)/ National Centre for Atmospheric Research (NCAR) reanalysis data. It was seen that more moisture was transported to the equatorial regions in 2002 especially in the month of July, where as in the case of 2005 moisture transport was more towards the subcontinent. An analysis of the Outgoing Longwave Radiation differences for 2005 and 2002 for July, showed that during the prolonged break in monsoon condition in 2002 the eastern equatorial Indian Ocean was convectively more active when compared to the Bay of Bengal. Thus reduced convective activity in the Bay of Bengal in July, can have profound influence in reduction of moisture transport to the subcontinent and the subsequent monsoon activity/rainfall.