Category and Session number: OA13

Preferred Mode of Presentation: Oral

Study of Indian Ocean Dipole by Community Atmospheric Model

JAI-HO OH and HEMANTKUMAR S. CHAUDHARI

Dept. of Env. Atmos. Sci., Pukyong Nat'l Univ., Busan, Korea, jhoh@pknu.ac.kr

Indian Ocean Dipole Mode (IODM), is one dominant pattern of interannual variabilities of the Indian Ocean. This study uses PCMDI (Program for Climate Model Diagnosis and Inter-comparison) AMIP (Atmospheric Model Inter-comparison Project) SST data. Indian Ocean Dipole (IOD) phenomenon has been simulated successfully using Community Atmospheric Model of National Center for Atmospheric Research (NCAR) Community Climate Model (CCM).

Community Atmospheric Model (CAM) experiments have been classified into eight categories depending on Positive/Negative dipole and EL Nino/La Nina events. Model was forced by SST anomalies for each case which is combination of Pacific and Indian Ocean status. CAM experiments indicate that a positive phase of the IODM tends to enhance the Indian monsoon rainfall. According to Ashok et. al. (2001), AGCM simulations indicate that a positive phase of the IODM tends to enhance the Indian monsoon rainfall. It is found to be realistic in case of CAM experiments. Corresponding to positive phase of the Indian Ocean dipole, summer monsoon is stronger in India and South China Sea; but summer monsoon is weaker in the South China Sea and stronger in southwestern part of Indian peninsula for negative phase of the Indian Ocean dipole. IOD peaks during September-November, it shows better relationship with October-December rainfall over southeast India. Air–sea coupled IOD phenomenon evolves during spring, matures in fall, and decays in winter (as noted by Saji et al., 1999). In general the relationships during the preceding and following years are reverse in sign to that during the same year, suggesting the inherent biennial component present in the Indian Ocean (Meehl, 1993). Saji et al. (1999) showed that Zonal wind anomalies along the Equator and alongshore wind anomalies off Sumatra intensify together with the SST dipole. A dramatically rapid peaking of these features occurs in October, following by a rapid demise, which is consistent with results obtained by CAM experiments.

Keywords: Indian Ocean Dipole, SST, Community Atmospheric Model.

References

[1] G. Meehl, *J. Clim.* **6,** 31-41 (1993).
[2] K. Ashok, Z. Guan, and T. Yamagata, *Geophys. Res. Lett.* **28,** 4499-4502 (2001).
[3] N. Saji, B. Goswami, P. Vinayachandran and T. Yamagata, *Nature.* **401,** 360-363 (1999).