Roles of Indian and Pacific Oceans in the Seasonal Transitions between Indian and Australian Monsoons

Jin-Yi Yu and Shu-Ping Weng

Department of Atmospheric Sciences
University of California at Irvine
Irvine, CA 92697-3100

TEL:949-824-8794 ; FAX:949-824-3874
E-Mail: jyyu@uci.edu

This study uses a series of CGCM (coupled atmosphere-ocean general circulation model) experiments to examine the importance of air-sea interactions to Madden-Julian Oscillation (MJO) in the Indian-Pacific Ocean sectors. A total of three CGCM simulations are performed: the Pacific Run, Indo-Pacific Run, and Indian-Ocean Run. In each CGCM run, air-sea interactions are restricted to a certain portion of the Indian-Pacific Ocean by including only that portion of the ocean in the ocean model component of the CGCM. The Pacific Run includes only the tropical Pacific Ocean in the CGCM; the Indian-Ocean Run includes only the Indian Ocean in the CGCM; and the Indo-Pacific Run includes both the Indian and Pacific Oceans in the CGCM.

Our CGCM results indicate that only the air-sea interactions in the Pacific Ocean sector can affect MJO activity. Air-sea interactions in the Indian Ocean have little impacts on MJO. The Pacific air-sea interactions affect MJO not only in the Pacific sector but also in the Indian Ocean sector. The role of the Walker circulation in allowing this "up-stream" impact of Pacific air-sea interaction on MJO will also be discussed.