



Oceanic Channel of the IOD-ENSO teleconnection over the Indo-Pacific Ocean

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The lag correlations of observations and model simulated data that participate the Coupled Model Intercomparison Project phase-5 (CMIP5) are used to study the precursory teleconnection between the Indian Ocean Dipole (IOD) and the Pacific ENSO one year later through the Indonesian seas. The results suggest that Indonesian Throughflow (ITF) play an important role in the IOD-ENSO teleconnection. Numerical simulations using a hierarchy of ocean models and climate coupled models have shown that the interannual sea level depressions in the southeastern Indian Ocean during IOD force enhanced ITF to transport warm water of the Pacific warm pool to the Indian Ocean, producing cold subsurface temperature anomalies, which propagate to the eastern equatorial Pacific and induce significant coupled ocean-atmosphere evolution.

The teleconnection is found to have decadal variability. Similar decadal variability has also been identified in the historical simulations of the CMIP5 models. The dynamics of the inter-basin teleconnection during the positive phases of the decadal variability are diagnosed to be the interannual variations of the ITF associated with the Indian Ocean Dipole (IOD). During the negative phases, the thermocline in the eastern equatorial Pacific is anomalously deeper so that the sea surface temperature anomalies in the cold tongue are not sensitive to the thermocline depth changes. The IOD-ENSO teleconnection is found not affected significantly by the anthropogenic forcing.