



Rectification Effect of ENSO Cycle in Mean Climate

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An ocean general circulation model, forced with the observed monthly mean wind stress from 1958 to 2002, develops rectified climate anomalies, compared to a run in which the forcing was climatological. The net rectified signature produced by anomalous wind stress associated with ENSO cycle is subsurface warming about 1.2C in the eastern Pacific and subsurface cooling in the western Pacific about -0.8C. Thus nonlinear rectification of ENSO cycle can reduce zonal gradient of thermocline depth as well as ENSO instability. In the eastern equatorial Pacific, the deepened thermocline is resulted from nonlinear dynamical heating associated ENSO asymmetry. However, the shallowed thermocline is mainly due to enhanced upwelling in the western equatorial Pacific. When the sign of zonal and meridional wind stress anomaly is reversed artificially, the similar rectified climate signal can be found.