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# Investigating Variation of the Thermocline in Equatorial Pacific Ocean Using EOF Method

Y.-H. Li and B.-F. Chao

College of Earth Sciences, National Central University, Chung-Li, Taiwan, ROC(jay1030_1@hotmail.com)

The transition layer between the upper warm mixed layer at the surface and the deep water layer, the thermocline is a notable feature, especially in the tropical oceans, that acts as a distinct stable interface at ∼100m depth. The depth of thermocline generally varies with the sea surface temperature (SST). On the other hand, the El Nino-Southern Oscillation (ENSO) is a very prominent phenomenon in terms of SST in the equatorial Pacific. Here we study the regional thermocline depths identified from the ocean water temperature profile and their relationship and interaction with ENSO. We use the temperature profile data from XBTs (Expendable bathy-thermographs), CTD (Conductivity temperature depth) and Argo floats available in the EN3 (ENACT/ENSEMBLES VERSION 3) data set, from 1993 through 2003 (eleven years). We select the region of 30°N ∼ 30°S and 135°E ∼ 285°E. We calculate the EOF (Empirical Orthogonal Function) to analyze the space-time variability of the thermocline depth in the region. For reference, we also do the same with the ECCO ocean circulation model output. These results, when compared with the mass transports and the steric sea level variation, are pertinent to the understanding of the dynamics and evolution of tropical ocean circulations, in particular ENSO.