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Variability in Horizontal temperature advection associated with Tropical Instability Waves in the Atlantic

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Temperature advection is a key factor in helping to understanding the tropical ocean heat budget, which is a focus of regional and global climate variability. We employ a new concept of using observational data in assessing the interaction of Tropical Instability Waves (TIWs) with the mixed layer in the central equatorial Atlantic. We used data from Prediction and Research Moored Array in the Atlantic (PIRATA) moorings, combining ADCP and temperature at 0N/23W and surface current and temperature at 10S/10W and 12N/23W. Satellite Sea Surface Temperature (SST) of Tropical Rainfall Measuring Mission Microwave Imager (TMI) and NCEP/Reynolds SST were used to complement the in situ data. Zonal convergence of TIW centres is observed to shallow the mixed layer, resulting in entrainment. Variations in zonal temperature advection that appeared in both directions are attributed to the meridional fluctuations of the TIWs as observed from the mooring data. Results from the current meter data within the vicinity of TIW region both showed a westward advection of temperatures that is typical of each region and varying seasonally. Correlations based on the 10-day averaged data between February 2004 and June 2006 is 0.92 (PIRATA SST and TMI) and 0.92 (PIRATA SST and NCEP).