

ON THE THERMAL STRUCTURE OF THE HAWAIIAN WATERS

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ABSTRACT

A large data set of XBT, AXBT, MBT, and CTD measurements collected in the region around the Hawaiian Islands from 1963 to 1982 is analyzed to obtain additional information concerning the regional oceanography of the area.

Examination of the mean fields of temperature and isotherm displacement resolves the large scale structure, with the highly variable high frequency motions characteristic of this area appearing as subgrid-scale noise. Near the islands isotherms tend to parallel the ridge. At depth the isotherms appear to shoal along and south of the ridge.

Harmonic analysis of time series shows an unexpected semiannual signal in the thermocline which is coherent around the islands and is present in sea level. A strong annual signal is restricted to the surface layers, as is a low frequency fluctuation with 4 year period, possibly forced by large scale atmospheric fluctuations. In the lower layers fluctuations of 2-2.5 year period are present which exhibit wave-like characteristics.