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Temperature Anomalies Between San Francisco and Honolulu, 1966–1974, Gridded by an Objective Analysis

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ABSTRACT

Over the eight years of expendable bathythermograph observations from merchant ship transits between San Francisco and Honolulu have been analyzed to determine the nature of subsurface temperature anomalies. The irregularly distributed data were interpolated for 0, 90, 170 and 400 m by an objective analysis and then contoured. Statistical properties which had to be computed for the gridding procedure are described and presented.

The statistical properties and anomaly patterns in the upper layers are contrastingly different from those in the main thermocline and below. In the upper layers the significant correlation of anomalies is limited to time separation of less than 40 days, but extends to distance separations beyond 900 km. At the 170 m level in the main thermocline, anomalies are correlated to 100 days, but extend to only 190 km. The standard deviation increases from the surface to 170 m and then decreases to a minimum at 500 m. The peak of the standard deviation at a level shifts west as depth increases. Vertical correlations reveal that temperature anomalies at the surface are uncorrelated with those in the main thermocline. The main thermocline anomalies move along the route toward Honolulu at about 2.9 cm s^{-1} , which is suggestive of baroclinic Rossby waves.

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