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Comparison of Shipboard Hydrographic Time Series off California and Hawaii

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Time series of hydrographic measurements off Central California (CalCOFI line 67) are compared with measurements made during the same month to the north of Oahu, Hawaii (Station ALOHA). Off Hawaii, the upper 1000 m were sampled every two or three hours for three days to remove internal tide variability. Along Line 67, an onshore-offshore section of 17 stations which are 20 km apart were occupied over a period of $\sim$ 2.5 days (or longer, depending upon weather conditions and sea state). These 17 stations were averaged to obtain a similar sample size to the Hawaii data. The California data were obtained quarterly beginning in 1997. The Hawaii data are monthly and begin in 1988.

The inshore portion of the California data were dominated by poleward geostrophic flow. At a distance of 100 km from the coast, the equatorward geostrophic flow of the California Current dominated the surface flow and deepened further from shore. Using a 1000 dbar reference, the dynamic heights were in good agreement with climatological data and gave an equatorward flow at the surface of 2.1 cm/s between California and Hawaii.

Water properties to the bottom were measured at both locations. Off California, this was done at the station farthest from shore where water depth is 4500 m. The geostrophic flow between California (about 30 casts) and Hawaii data (more than 200 casts) was computed relative to 4500 dbar. Between the bottom and about 750 dbar, the flow was poleward, <0.001 m/s, and yielded a total northward transport of about 3.5 Sv for waters below 750 m.

Trends of salinity, oxygen on isopycnal surfaces common to both data sets are determined for the period 1997-2010.