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Stationary and Traveling Mesoscale Perturbations in the Kuroshio Extension Current

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ABSTRACT

Several hundred XBT observations in the western North Pacific were collected each month over a 2½ year period 1976–78. They have been assembled into a monthly map sequence of thermocline temperature in the Kuroshio Extension Current, having 100 km spatial resolution. The overall time, mean of the maps exhibits mesoscale (200–600 km) perturbations which correlate with several major bathymetric features, especially the Shatsky Rise. Time variability about the mean decreases significantly east of the Shatsky Rise. In addition, time-variable mesoscale disturbances propagate zonally westward at $\sim 3.8 \text{ cm s}^{-1}$. Attempts to explain the observed propagation phase velocity through simple analytic baroclinic Rossby wave theory lead to the implication that there exists in the region an eastward deep mean flow of 3 or 4 cm s^{-1} . Direct current measurements of long duration are required to help resolve and explain these observations.

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