BAROCLINIC ROSSBY WAVES IN THE CENTRAL AND EASTERN NORTH PACIFIC

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ABSTRACT

A cross spectral wave model fitted to 20-year time sequences of baroclinic potential energy in the central North Pacific demonstrates that first mode baroclinic Rossby waves fit the best among all possible wave types at the 10- and 6.7-year periods in the 20-30°N zone and produce about 50% of the observed covariance. The model fitted to sub-surface temperature fluctuations along the Honolulu-San Francisco great circle section reveals best-fit wavenumbers that could be 'long-section projections of wavenumber vectors of first mode baroclinic Rossby waves of 42.5- to 9.4-month periods. The waves could be producing 50-60% of the covariance observed in the section. A mean shear current of only 2 cm/sec magnitude at the surface, diminishing to zero at a depth of 700 m can substantially alter the dispersion of baroclinic Rossby waves. A climatological mean current profile representing the California current is used to generate a numerical dispersion relation, which is then used to interpret some of the 'long-section wavenumbers.