Abstract View

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Coastal Trapped Waves in a Baroclinic Ocean

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ABSTRACT

Coastal-trapped waves are studied in a two-layered, non-flat shelf model. Internal Kelvin wave and quasi-geostrophic waves appear as eigenmodes of the system. The latter reduce to the familiar barotropic shelf waves only in the limit of vanishing stratification. With strong stratification, i.e., where the internal Kelvin wave phase speed is larger than the phase speed of the quasi-geostrophic wave, quasi-geostrophic waves are bottom-trapped. Resonant coupling occurs when the two types of waves have compatible phase speeds; in this case, the relative amplitude distribution of the resonant modes is very sensitive to the change of the baroclinic radius of deformation. Implications of this work for the study of shelf water response to external disturbances are briefly discussed.