

RESONANT ROSSBY WAVES ON THE OUTER CONTINENTAL SHELF IN THE AMUNDSEN SEA

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ABSTRACT

Mooring data from the western flank of the deep Dotson Trough are presented with focus on short-term variability. The data show the presence of strong barotropic oscillations with period 40-60 hours. The oscillations are visible in velocity, temperature, salinity and pressure. The period corresponds to topographic Rossby waves of near-zero group velocity and wavelength 150 km, i.e. the double channel width. It is suggested that the oscillations are resonant topographic Rossby waves which are blocked (i.e. zero normal velocity) in the shallow end and free (i.e. zero normal velocity shear) in the deep end. The simplified analytical theory for Rossby waves on a constant bottom slope is compared with the results of a numerical model developed by Brink in 1986. The results are qualitatively similar, although the numerical model has zero group velocity for frequencies very close to the observed while the analytical model has zero group velocity for somewhat lower frequencies.