

Moored observations of bottom-intensified motions in the deep Canada Basin, Arctic Ocean

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In the deep Canada Basin, below the sill depth (about 2400 m) of the Alpha-Mendeleyev Ridge, potential temperature and salinity first increase with depth, then remain uniform from about 2600 m to the bottom (approximately 3500 m). Year-long moored measurements of temperature, salinity and pressure in these deep and homogeneous bottom waters reveal significant vertical excursions at sub-inertial frequencies (periods of about 50 days). The observed isopycnal displacements have amplitudes up to 100 m at the top boundary of the bottom layer; moored profiler measurements in the intermediate water column indicate that displacement amplitudes decrease above the homogeneous bottom layer. We show how the sub-inertial excursions are consistent with a bottom-trapped topographic Rossby wave. Given the magnitude of the bottom slope in the vicinity of the mooring, the observed vertical velocities correspond to only weak (about 1 cm/s) cross-slope horizontal velocities. Hence, while the generation mechanism for the observed waves remains an open question, it seems only a moderate energy source is required.