Abstract View

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Internal Tides on the Australian North-West Shelf: A Preliminary Investigation

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ABSTRACT

An analysis of current meter data and cross-shelf temperature measurements from the Australian North-West Shelf shows the existence of internal waves of semi-diurnal period. Vertical displacements of density interface am seen to reach ~ 30 m, a value nearly half the water depth. Baroclinic currents are isolated from the measurements and have amplitudes reaching 0.2 m s^{-1} in the cross-shelf direction.

The baroclinic motion is shown to be consistent with a first-mode internal wave propagating in the onshore direction at phase speed of approximately 0.4 m s^{-1} with wavelength of 20 km and being rapidly damped in amplitude while propagating across the shelf. The dissipation of the internal tide across the shelf appears to result from the influence of turbulent mixing processes. There is little coherence between the barotropic tide and the internal tide and it is suggested that this results from the internal tide being generated over a large section of the shelf slope down to a depth of approximately 900 m. There is no obvious point-source of generation for the internal tide.