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Presenter Last Name: Queiroz

Ocean observations show cyclonic fronts intensify internal tides off eastern Australia.

Authors: Queiroz, Eduardo*[1], Kerry, Colette[1], Roughan, Moninya[1].

Coastal and Regional Oceanography Lab, School of Mathematics and Statistics, University of New South Wales, Sydney, NSW 2052, Australia.[1]

Corresponding author: e.vitarellidequeiroz@student.unsw.edu.au

Internal waves can generate ocean mixing, surface convergences and near-bottom currents, so their predictability is of interest. They can modulate temperature and nutrient concentrations, which can affect biological productivity. The interaction between internal waves and mesoscale ocean features is still relatively unknown. Using data of temperature, salinity and velocities from an array of deep ocean moorings, this study characterises the strength and variability of the internal wave at the tidal frequency, in both time and space, off eastern Australia (~ 27°S). Energy in the diurnal frequency band is, generally, greater than in the semidiurnal band. Internal tide variability is compared to local tidal forcing, stratification, current velocities and eddy kinetic energy to determine the influence and interaction with mesoscale ocean circulation. The results reveal that the strength of the locally generated internal tide above the continental slope is modulated by the passing of mesoscale cyclonic front that alters the local stratification and velocity field. The results provide insight into the origin of the internal tides propagating onto the shelf and the mechanisms of variability. Studying the characteristics of internal tides and their interaction with ocean features helps us understand their variability and improve predictability which is non-trivial and in contrast to the deterministic barotropic tides that generate them.