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The dynamics of internal tidal waves in Todos Santos Bay, Baja California, during experiment FLOO-2007

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The aim of this work is to describe the characteristics of internal waves in Todos Santos Bay, Baja California (Mexico) from direct measurements made during the international experiment Fluxes Linking the Offshore with the Onshore (FLOO), which was held in August 2007. Time series of temperature and currents were obtained in the study area, placing several submerged moorings with chains of HOBO-V2 sensors and an ADCP. In addition, transects were made using a towed undulating CTD system and chains of thermographs which had a response time of 5 s. These measurements allowed the construction of the scenarios of generation, propagation and disintegration of the internal tide in the Bay. The internal tidal waves are generated by the barotropic tide at the edge of the continental shelf north of the Bay, have wavelengths $\sim$9 km, are distributed in the form of an arc, and travel to the southeast with phase velocity $\sim$20 cm/s . In shallow waters near the coast, tidal waves are refracted and quickly divide into groups of short nonlinear internal waves with amplitudes 15-20 m, periods 5-20 minutes, and wavelengths 50-200 m. Nonlinear internal waves play an important role in the dynamics of Todos Santos Bay, especially in the coastal zone. During partial or total destruction, vertical mixing and sudden changes of stratification take place. This affects the formation of the vertical structure of water density and ocean biological productivity.