



Stratification and mixing processes in presence of estuarine signals and internal near-inertial waves

M. B. Aguiar-González, A. Rodríguez-Santana, J. Cisneros-Aguirre and A. Martínez-Marrero

Department of Physics, University of Las Palmas de Gran Canaria, Spain
(miguel.aguiar101@estudiantes.ulpgc.es / Phone: +34 928-454521)

We have analyzed the presence of internal near-inertial waves in combination with the inputs of estuarine waters into the Setúbal Bay shelf using ADCP (Acoustic Doppler Current Profiler) and CTD (Conductive Temperature Depth) measures. These data were taken during MREA04 experiment (Maritime Rapid Environmental Assessment 2004) by NATO Undersea Research Center (NURC) on the southwest coast of the Iberian Peninsula since 27 March to 18 April 2004.

The study area is characterized by a strong stratification at surface because of the inputs waters from Sado estuary. However, in presence of the internal near-inertial waves we observed a clear change in the vertical structure of density. In order to study this change we have calculated vertical distributions of Brunt-Väisälä frequency, vertical shear, gradient Richardson number and diapycnal diffusivity depending of gradient Richardson number (Pacanowski and Philander, 1981) at several times. As a result we find that when the internal near-inertial waves were present the diapycnal fluxes increased and the estuarine signal diminished, indicating that these waves can play a key role on diapycnal mixing processes.

We conclude that instabilities induced by the vertical shear associated to the internal near-inertial wave may be affecting to the stratification being a possible source of energy to transport properties along the entire water column between oceanic and estuarine waters.