



Non linear internal tides, turbulent mixing and their impact on phytoplankton distribution in the continental shelf of South Brittany

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Nonlinear internal wave dynamics is well known to have a considerable impact on biogeochemical fluxes and phytoplankton distribution. This is particularly true in coastal areas where large horizontal gradients, strong barotropic currents and bottom interactions can enhance these processes. In the Bay of Biscay large internal tides generated at the shelf break propagate on the continental shelf. Propagation of these internal tides is largely affected by strong nonlinear effects leading notably to the formation of large internal solitary waves. In July 2010 the Per2tong campaign was set up in South Brittany in order to assess the impact of nonlinear internal waves propagating on the shelf and associated turbulent mixing on the phytoplankton distribution.

Intense measurements of hydrographic properties, currents and phytoplankton biomass were collected at two locations (65 m depth and 25 m depth) on the shelf. In addition microscale measurements of turbulent dissipation were performed using a temperature gradient microstructure profiler. This data set is used here to characterize the dynamical link between nonlinear waves forcing and small scale turbulence affecting phytoplankton distribution. The mechanisms of formation of thin layers of phytoplankton in the pycnocline and the impact of small scale turbulence on these structures is notably discussed