Geophysical Research Abstracts, Vol. 8, 08157, 2006
SRef-ID: 1607-7962/gra/EGU06-A-08157

Internal Wave Breaking at Continental Slopes

B. Martin (1), M.D. Piggott (1), C.C. Pain (1), P.A. Allison (1), P. Hall (2)

(1) Department of Earth Science and Engineering, Imperial College London, UK (b.martin@imperial.ac.uk; http://amcg.ese.ic.ac.uk), (2) Proudman Oceanographic Laboratory, Liverpool, UK (http://www.pol.ac.uk)

Internal gravity waves can provide a sufficient source of energy to activate strong diapycnal mixing near sloping boundaries, which can in turn account for a significant portion of the overall oceanic vertical mixing. The generation of an upslope-propagating front and the periodic strongly sheared downslope flow at the benthic boundary continuously pumps stratified fluid into the mixed layer and extracts mixed boundary fluid.

The angle beween the group velocity of an internal gravity wave and the horizontal is preserved by reflection at a fixed slope. When this angle is close to that of the slope (the critical angle), the reflected wave has a much larger amplitude and exhibits non-linear behaviour, and greater shear and mixing result.

We present the results of numerical investigations of internal wave reflection at continental slopes using the Imperial College Ocean Model (ICOM), a non-hydrostatic, finite-element model that includes anisotropic mesh adaptivity. The ability of the model to focus resolution where it is most needed in response to the evolving flow makes ICOM an ideal tool to study the propagation of the upslope front and subsequent turbulent flow.