Geophysical Research Abstracts, Vol. 7, 03880, 2005 SRef-ID: 1607-7962/gra/EGU05-A-03880 © European Geosciences Union 2005



Observation of nonlinear internal waves of elevation with trapped cores in Massachusetts Bay.

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We report on near-bottom internal waves of elevation observed in the late summer of 2001 in Massachusetts Bay. Both density and currents were sampled at high resolution, resulting in a complete description of the physical properties of the waves and the wave-guide which does not depend on theoretical models to fill in gaps in the observations. The waves were characterized by an amplitude that was nearly half the water depth, pronounced steepness and trapped cores. We use concurrent offshore measurements to show that these waves originate when internal waves of depressions propagating in the deeper section of Massachusetts Bay interact with the shoaling bottom.