

Analysis of internal tide in altimeter-derived spectra of baroclinic
inertia--gravity waves

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ABSTRACT

Case studies of sea surface height (SSH) and thermocline depth oscillations are reported with an emphasis on the interaction between a semi-diurnal tide and an ambient field of long internal gravity waves. Using Topex/Poseidon altimeter measurements in selected ocean regions and inverted echo-sounder measurements of thermocline depth oscillations near the Gulf Stream, we analyze the entire spectrum of baroclinic inertia--gravity waves in which the internal tide may or may not be pronounced. Comparison of the altimeter and in situ measurements confirm our earlier claim that in some ocean regions SSH variations are dominated by a high-frequency "noise" caused by a broad spectrum of long internal gravity waves. The important role of this "wave turbulence" in ocean dynamics and climate is discussed.