Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

Nonlinear harmonic generation by diurnal tides SCOTT WUNSCH, Johns Hopkins University — Recent observations from the South China Sea have demonstrated that diurnal tides sometimes generate higher harmonics. Similar harmonic generation has been found in laboratory experiments and numerical simulations of internal wave beams refracting into a pycnocline. Here, a weakly nonlinear theory of internal wave refraction is applied to oceanic diurnal tides in an idealized stratification profile. The harmonic amplitude is calculated as a function of the tidal frequency and the pycnocline characteristics. The results indicate that harmonic generation by nonlinear refraction of diurnal tides is consistent with the South China Sea observations.

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Date submitted: 23 Jul 2015 Electronic form version 1.4