Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Suppression of tidal conversion by virtual seafloor[1] HARRY L. SWINNEY, LIKUN ZHANG, University of Texas at Austin — We examine in numerical simulations how the conversion of tidal energy into internal gravity wave energy is suppressed by wave interference between adjacent ridges of steep topography [L.K. Zhang and H.L. Swinney, Phys. Rev. Lett. 112, 104502 (2014)]. Simulations for both periodic and random steep topographies reveal that the time-averaged wave energy radiated upwards arises only from the portion of the ridges above an elevated "virtual seafloor." We find that the average radiated wave power can be predicted by linear theory for weak topography by replacing the actual floor with the virtual floor. The virtual floor concept is used to extend linear theory to predict the energy conversion rate for steep topography. This nonlocal modification of linear theory should be useful in estimating the energy flux generated by tidal flow over the global seafloor.

[1]Supported by ONR MURI Grant N000141110701 (WHOI). Also, LZ is supported by the 2013-14 ASA F. V. Hunt Postdoctoral Research Fellowship.

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Date submitted: 31 Jul 2014 Electronic form version 1.4