Geophysical Research Abstracts, Vol. 9, 09126, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-09126

Tidal conversion by supercritical topography

N. Balmforth and T. Peacock
Dept. Math., UBC

Calculations are presented of the rate of energy conversion of the barotropic tide into internal gravity waves above obstacles on the ocean floor. The calculations extend previous results for subcritical topography (wherein waves propagate along rays whose slopes exceed the topographic slopes everywhere), by allowing the obstables to be arbitrarily steep, or supercritical (allowing waves to propagate at shallower angles than the topographic slopes and to be scattered both up and down). A complicated pattern is found for the dependence of energy conversion on ϵ, the ratio of maximum topographic slope to wave slope, due to a sequence of constructive and destructive interferences between scattered waves. The theory is compared to experiments in order to judge the importance of nonlinear effects.