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# Propagation of Barotropic Continental Shelf Waves over Irregular Bottom Topography

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### ABSTRACT

Using a geometry which roughly approximates that of a typical continental shelf and slope, the effects of a random bottom topography on free barotropic shelf waves are found. The bathymetric irregularity induces damping of the coherent wave due to scattering, as well as Phase velocity Changes. For a representative realization of the bottom topography, the damping of low-mode long waves due to scattering is apparently comparable to that due to turbulent bottom friction. Damping peaks occur at frequencies where the coherent wave scatters into modes having a zero group velocity. Generally, the breadth of the peaks is a maximum when the alongshore topographic scale and the zero group velocity wavelength are comparable. Strong scattering to high modes, which have low phase velocities, may be prevented by the presence of a mean alongshore flow.

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