Abstract View

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A Numerical Study of the Propagation of Topographic Rossby Waves

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ABSTRACT

The propagation of linear barotropic Rossby waves is investiaged numerically over a one-dimensional topography similar to the continental rise and slope. A point source is used to generate waves with periods from 4 to 36 days. The resulting distribution of streamfunction and kinetic energy density is examined.

The result show that the propagating of tropographic Rossby waves depends on the wave period. Over the continental rise, waves are generated mainly by low-frequency disturbances at periods of about a month. In addition, the continental slope is a good insulator to these waves. Therefore, deep ocean circulation will not influence motions on the continental shelf. At 36 and 15 days, the steep continental slope is a wave guide, and regions of high energy density generated by local sources may be found. Energy of 36-day waves over the continental shelf cannot penetrate the steep slope. Although waves of periods shorter than a week may reach the lower slope, these waves are trapped by the coast, similar to shelf waves, Consequently, the deep ocean circulation is hardly influenced by motions on the shelf and slope.