



Abstract View

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On Forced, Long Continental Shelf Waves On an f -Plane

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ABSTRACT

Previous studies of forced, long continental shelf waves on an f -plane have considered motion on the shelf and slope which is driven by an alongshore component of the wind stress, essentially through the suction of fluid into the surface layer at the coast. These studies have utilized a boundary condition, which arises consistently in the long-wave nondispersive limit for *free* shelf waves, that at the slope-interior junction the alongshore velocity component $v \approx 0$. This is an extremely useful condition for problems concerning forced motion on the shelf and slope, because it completely uncouples the motion in this region from that in the interior and it allows the shelf-slope problem to be solved independently of the interior problem. It is shown here, however, that this condition is not correct in general for wind-stress-forced f -plane motion. A proper formulation of the f -plane, forced shelf wave problem in the long wave limit is presented. The motion on the shelf and slope, in general, is coupled with and forced by the flow in the interior.

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