Abstract Submitted
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Effect of the bottom profile on coastal topographic waves[1] GERARDO RAMÍREZ ROSARIO, LUIS ZAVALA SANSÓN, CICESE Dep.Oceanografia Fisica — We consider linear shallow water equations (LSWE), for a straight coast whose profile is given by $H(x) = \alpha x^s$, where s is a positive real number and x is the distance perpendicular to the coast. We show how the LSWE can be transformed in to an ordinary differential equation, which is solved by perturbation methods. The perturbation term depends on wave frequency, the Coriolis parameter and geometric features of the coast and decays exponentially with offshore distance. The solutions of the unperturbed problem are the associated Laguerre polynomials. These polynomials are the basis for finding approximate solutions of the perturbed problem. For the case $s = 1$ the method recovers the solution reported in the literature. The dispersion relation of the unperturbed problem corresponds to that obtained with the rigid lid approximation. The dispersion relation shows that for small s sub-inertial modes are less affected by topography than super-inertial modes. However, for large s sub-inertial modes are more affected than super-inertial. An interesting case is $s = 2$, since the eigen frequencies do not depend on wave number.

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