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Joint effects of topography and rotation in internal solitary waves[1] KARL HELFRICH, Woods Hole Oceanographic Institution, Woods Hole MA, LEV OSTROVSKY, University of Colorado, Boulder CO — An asymptotic, adiabatic theory for the evolution of an internal solitary wave governed by the variable-coefficient, rotation-modified Gardner equation (Korteweg-de Vries with cubic nonlinearity) is developed and used to explore the joint effects of variable topography and rotation on wave evolution. In particular, we explore the interplay between different singularities: terminal damping of the solitary wave due to radiation of inertia-gravity waves, the disappearance of quadratic nonlinearity, and, in the case of a two-layer stratification, the propagation toward and "internal beach (zero lower layer depth). Examples of the adiabatic evolution of a single solitary wave are compared to full numerical solutions of the rotating-Gardner equation. These results are also compared to those from an earlier study of the rotating-KdV equation (Ostrovsky and Helfrich 2019, *JPO* **49**). The effects of quadratic bottom drag will also be discussed.

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