Abstract Submitted
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Internal waves incident on a sheared ocean pycnocline SCOTT WUNSCH, HWAR KU, Johns Hopkins University — Internal waves are commonplace in the oceans. Near the surface, they interact with a sharply increasing density gradient (pycnocline) as well as near-surface currents. Here, fully nonlinear numerical simulations are used to study internal waves incident on a sheared pycnocline. Linear analysis of the unstable modes of a sheared pycnocline above a stably stratified fluid reveals that two types of instabilities may occur. One is the well-known Holmboe instability, while the other is a longer wavelength Kelvin-Helmholtz mode which couples more strongly to incident internal waves. Both types of instabilities are seen in the simulations, and the nonlinear evolution of each is explored. Possible implications of these results for oceanic internal waves are considered.

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