Abstract View

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Instability of Baroclinic Waves with Bottom Slope

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ABSTRACT

Pedlosky's theory explaining the behavior of unstable baroclinic waves in the β-plane is modified to include a sloped bottom (although the β effect is ignored). The result found is the same sort of nonlinear oscillatory behavior described by Pedlosky, except in the case of short wavelengths for negative shears. In that case, the theory predicts an initial explosive growth of the wave amplitude, so that it will reach amplitudes that are very large compared with its initial scale. This suggests a possible mechanism for small-scale current fluctuations in the oceans.