AMS Home   Journals Home   Journal Archive   Subscribe   For Authors   Help   Advanced Search   Search [Go]

Abstract View

The Amplitude of Baroclinic Wave Triads and Mesoscale Motion in the Ocean

Joseph Pedlosky

Department of the Geophysical Sciences, The University of Chicago, Chicago, Ill. 60637

ABSTRACT

The finite-amplitude dynamics of a resonant triad of baroclinic waves in a slightly unstable baroclinic current is examined. The wave in the triad which is linearly unstable on the current is assumed to have negligible cross-stream variation and therefore lacks a self-equilibrating mechanism. It is shown, however, that the triad cooperatively equilibrates although for certain initial conditions the amplitude of the waves may become quite large. The triad possesses the deformation radius as its characteristic scale in both horizontal directions. It is suggested, therefore, that this triad instability may be a mechanism for the production of intense mesoscale oceanic eddies. However, the dependence of the result on the choice of initial conditions does not make it possible to definitely scale the amplitudes with fixed and external oceanic parameters.

Options:
- Create Reference
- Email this Article
- Add to MyArchive
- Search AMS Glossary

Search CrossRef for:
- Articles Citing This Article

Search Google Scholar for:
- Joseph Pedlosky

top ▲