Abstract View

Volume 13, Issue 1 (January 1983)

Journal of Physical Oceanography
Article: pp. 43–53 | Abstract | PDF (720K)

The Effect of a Mean Current on Kelvin Waves

R. Grimshaw

Department of Mathematics, University of Melbourne, Parkville, Victoria 3052, Australia

(Manuscript received June 7, 1982, in final form August 20, 1982)

DOI: 10.1175/1520-0485(1983)013<0043:TEOAMC>2.0.CO;2

ABSTRACT

The effect of a mean current on Kelvin waves is considered, including the case when the current is not in geostrophic balance. Because the problem is non-separable, a perturbation scheme is developed for weak shear from which the effect of the mean current on the wave phase speed and decay rate are determined. The perturbation scheme also establishes that in general the Kelvin wave contains all vertical modes. The special case of a two-layer fluid is considered in more detail.