



Abstract View

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The Structure of an East Australian Current Anticyclonic Eddy

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ABSTRACT

An intense, anticyclonic, warm core winter eddy off the east coast of Australia was surveyed with an airborne radiation thermometer, expendable bathythermographs and a continuously recording surface thermosalinograph in September 1974. The eddy had a diameter of 250 km, a dynamic relief of 0.7 dyn-m and a mixed layer depth extending to over 300 m in the core. A strong current ring was present halfway from the center to the edge of the eddy with surface speeds ranging from 0.6 to 1.78 m s⁻¹. The dynamics of the eddy are related to previous knowledge of mesoscales in the East Australian Current region. The simplicity of the eddy structure defines a dominant and lone horizontal wavenumber whose inverse is the Rossby radius of deformation predicted by complex baroclinic instability theory. This simplicity allows a very simple eddy model to be proposed with first vertical baroclinic mode structure with a vertical depth scale of 430 m. The interior deep mixed layer was completely enclosed by a shell of isothermal water; this double layering indicates that large-scale entrainment of surface water may be an important feature of eddy generation off East Australia.

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