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Observations of Eddy Formation off East Australia

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ABSTRACT

Warm core closed mesoscale eddies have been repeatedly observed off the southeastern coast of Australia. One eddy was observed to close off around latitude 35°S during the period February–March 1975. This eddy was resurveyed seven weeks later, having moved only about 45 km westward. It had then assumed a more circular and stable shape. The principal feature of the eddy was a subsurface lens-shaped core of warm isothermal water which formed in less than 10 days. We suggest that baroclinic instability producing vertical motion caused this eddy to close off, a process differing from that of the Gulf Stream in which a poleward meander pinches off and separates from the main boundary current. The lens of this eddy formed by upper layer convergence and downwelling, with associated divergence in the abyssal layer. Thus the frequent occurrence of eddies in the area may be linked to bottom topography, the process in this instance being sufficient to cause the eddy to become weakly trapped.

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