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Entrainment and the Termination of the Equatorial Undercurrent

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ABSTRACT

An ideal fluid model of the Equatorial Undercurrent is modified by the addition of a specified, cross-isopycnal entrainment of fluid into the upper mixed layer. The entrainment is limited to a narrow region straddling the equator. It is shown how this entrainment serves to modify the value of the Bernoulli function along the equator.

For cases in which the Bernoulli function is rendered constant along the eastern boundary, the transport in the undercurrent is completely exhausted by the time the current reaches the eastern wall. The transport of the current is transferred to the upper mixed layer where it exits poleward. It is suggested that the gradual bleeding by entrainment rather than inertial collision is responsible for the eastern termination of the undercurrent.

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