



## Abstract View

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## Separation of an Inertial Boundary Current from a Curved Coastline

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### ABSTRACT

A two-layer model is used to examine the separation of an inertial boundary current from a curved coastline and its subsequent path as a free jet. To isolate the inertial effect, the boundary current is confined to the upper layer and insulated from the ocean interior by a free streamline. The separation occurs when the interface outcrops and forms a free streamline. Besides the constraint imposed by the coastal boundary, the primary dimensionless parameter that regulates the separation point and the subsequent current path is the scaled volume flux of the current ( $Q$ ). Increasing  $Q$  caused the current to separate at a lower latitude. The separation also occurs where the coastline has a large positive curvature (i.e., convex outward). After the separation, the current can either mender or loop back on itself depending on the flow direction at the separation point. Application of the model to the Agulhas Current can reproduce the retroflexion feature (i.e., a current turning back on itself) with roughly the correct dimensions, suggesting that the inertial and beta effect play a dominant role in the phenomenon.

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