Abstract View

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The Hydraulics of Local Separation in a Coastal Current with Application to the Kuroshio Meander

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ABSTRACT

A hydraulic theory is advanced to explain the large sustained meandering of the Kuroshio Current to the south of Japan. It is shown that in general a promontory induces separation of a coastal current. Once separated the current will meander on the second derivative of the topography (i.e. it is *not* a shelf wave-like meander) in barotropic waters, and with Rossby wave-like behavior in baroclinic waters. The theory reduces to a hydraulic description of the White and McCreary model of the Kuroshio meander away from the coast but avoids difficulties associated with that theory at the source of the meander at the Kyushu promontory.