AMERICAN METEOROLOGICAL SOCIETY
AMS Journals Online

AMS Home   Journals Home   Journal Archive   Subscribe   For Authors   Help   Advanced Search   [Search]   Go

Abstract View

Dynamics of the Kuroshio Large Meander: Two-Layer Model

Jong-Hwan Yoon and Ichiro Yasuda

Geophysical Institute, University of Tokyo, Bunkyo-ku, Tokyo, Japan

ABSTRACT

A simple two-layered in/outflow model is studied to explain the peculiarity of the Kuroshio path. The geometry south of Japan with a length scale L and the characteristic velocity U of the Kuroshio give an important parameter $\gamma = 2\pi U/\beta/L$. The Kuroshio can take two kinds of paths for a given value of γ (multiple equilibria). One is straight path and the other a meandering path. The selection of a path. The selection of a path in a multiple equilibrium state depends upon the history of the parameter γ (the hysteresis phenomenon).

The combined effect of horizontal viscosity along the coast and the inclination of the coastline are essential factors which control the Kuroshio path as well as γ. An increase in the coastline inclination increases the effect of horizontal viscosity along the coast where a western boundary layer is formed due to the effect of β. An increase in the viscous effect along the coast makes a straight path possible when the inlet velocity is small.

The effect of stratification is remarkable in such time dependent phenomena as eddy sheddings and the "trigger meander." Baroclinic energy conversions take place in these phenomena.

Options:
- Create Reference
- Email this Article
- Add to MyArchive
- Search AMS Glossary

Search CrossRef for:
- Articles Citing This Article

Search Google Scholar for:
- Jong-Hwan Yoon
- Ichiro Yasuda