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Geographic and Temporal Eddy Variability in the Western North Atlantic as Sensed by Satellite: An Eddy Generation Mechanism

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ABSTRACT

This paper has two objectives: to establish the satellite-derived mesoscale sea surface temperature anomaly as a useful oceanographic measure and to use this measure to explore an eddy generation mechanism.

The use of satellite-derived sea surface temperature anomalies and their movement as a means of developing ocean eddy statistics is made plausible through a comparison with POLYMODE and other studies. This, plus the marked improvement in satellite resolution since POLYMODE and the use of anomaly thresholds, provides confidence in the statistical results from satellite SST. The distribution in space and time of 65 coherent eddies as sensed by satellites in the western North Atlantic is presented. The region considered is west of 50°W and the time period is March 1981 to December 1984.

A region and season of enhanced warm core eddy formation that becomes apparent from a consideration of the data is discussed, a connection is made with the seasonal interior wind stress, and an instability and generation mechanism associated with the recirculation is proposed. The shedding of warm core eddies is seen as the mechanism associated with the recirculation is proposed. The shedding of warm core eddies is seen as the mechanism by which the Gulf Stream remains compatible with the gyre interior during seasonal wind stress spin-up.

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