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A Study of the Variability of Ocean Currents in the Northwestern Atlantic Using Satellite Altimetry

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ABSTRACT

Altimeter data obtained from GEOS-3 during the three year period 1975–78 for a region of the western North Atlantic which includes a portion of the Gulf Stream system and part of the open ocean area of the subtropical gyre are analyzed by a new technique which utilizes all the points along the satellite tracks. The physical phenomenon studied are the time-variable but almost geostrophic currents, or mesoscale eddies, so that geoid errors contaminate the scientific signal minimally and the dynamical interpretation is direct. Results presented include the spatial distribution of geostrophic eddy kinetic energy and examples of a synoptic map of the eddy field (April 1977) and of a time series at a point. These results are compared to and synthesized with a diverse and selected set of existing measurements and observations obtained *in situ* by a variety of instrumental techniques. The agreement is generally good, and the altimeter data analyzed provides new information on features in the map of mean eddy kinetic energy. The implications are that satellite altimetry will serve as a powerful quantitative tool in eddy current research and that even presently archived data contains further useful scientific information.

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