



## Abstract View

[Volume 16, Issue 3 \(March 1986\)](#)

### Journal of Physical Oceanography

Article: pp. 454–482 | [Abstract](#) | [PDF \(2.25M\)](#)

# The Mesoscale Spatial Structure and Evolution of Dynamical and Scalar Properties Observed in the Northwestern Atlantic Ocean during the POLYMODE Local Dynamics Experiment

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(Manuscript received May 26, 1983, in final form April 23, 1985)

DOI: 10.1175/1520-0485(1986)016<0454:TMSSAE>2.0.CO;2

### ABSTRACT

Dynamical properties examined in this paper are the dynamic height and the pressure on an isopycnal. Scalars are the salinity and the oxygen concentration on an isopycnal. The sea surface temperature and salinity are also examined. These properties are obtained from the spatially uniform and densely sampled hydrographic surveys conducted during a two-month period of the POLYMODE Local Dynamics Experiment in 1978 near 31°N, 69.5°W. The spatial maps of the dynamic height and the pressure of an isopycnal show that the baroclinic current in this area sometimes intensifies to a jetlike flow and at other times has the shape of elongated eddies. The current flows primarily in the NE–SW direction. Westward propagation occurs but varies in time and with depth. Eddies that transport water properties are also observed in this area. The salinity and the oxygen on an isopycnal are found to be correlated with itself and

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with each other from the surface to the 18°C water layer, within a 200-db range in the thermocline and an ~ 400-db range centered near 1500 db. There are periods during which the salinity and the oxygen as well as the sea surface properties are correlated with the near-surface current structure; the correlation is not found at deeper depths. These scalar properties, which are interpreted as tracers, are more vigorously “stirred” in and above the thermocline than below, where the motion is more wavelike. The net movement of water mass indicated by these tracers is due west through most of the water column during the period of the experiment.

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