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# Structure and Origin of a Small Cyclonic Eddy Observed during the POLYMODE Local Dynamics Experiment

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### ABSTRACT

In the POLYMODE Local Dynamics Experiment (31°N; 69.5°W) a small cyclonic eddy was discovered and mapped. The eddy was characterized by an upward doming of isotherms in the upper part of the main thermocline. The dynamical signal extended from the surface downward to a pressure of 800 db and outwards to a radius of 25–30 km. There was no deep-water property signal associated with the eddy, but a layer (~ 10m thick) of very low salinity water was observed at the sea surface immediately above the feature. The salinities in the surface layer were lower than any reported in the historical hydrographic data for the region. Rainfall is discounted as a possible source of this signal because of the layer's thickness and horizontal scale. Alternatively the closest source for the low salinity is in the Slope Water, some 500 km away. The eddy may have originated by the splitting near several Gulf Stream rings. This mechanism could also account for the unusually low surface salinities since rings may trap Slope Water and transport it into the Sargasso Sea.

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