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*A Detached Eddy in the Gulf of Mexico*¹

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This note presents some preliminary results of a still-incomplete detailed analysis of observations on the property distributions and currents in the eastern part of the Gulf of Mexico, with primary emphasis on the Eastern Loop Current. Observations were obtained aboard the R/V ALAMINOS in June 1966, 1967.

Previously, currents in this area have been inferred from observations at stations widely spaced, say, from 85 to 165 km apart. Data from such observations have not been adequate for a detailed study of the formation and dissipation of detached eddies in the eastern Gulf. For example, if limited data had been taken along the transects shown between A and B in Fig. 1 during the same periods as our observations, only one major circulation feature would have been indicated in this area—a loop current comprised of the Yucatan Current along the eastern edge of the Yucatan Shelf and its downstream extension flowing on a clockwise course through the region.

With data from closely spaced stations obtained in as short a time as possible, the picture is very different. Fig. 1 clearly indicates the presence of a large detached eddy just north of the eastern Gulf Loop Current. The depth of the 22°C isothermal surface as inferred from BT observations obtained in June 1967 on cruise 67-A-4 is as shown. In the water within the eddy as well as in that southeast of the Loop Current, salinity values at the core of the subtropical salinity maximum were greater than 36.7‰; maximum salinity values along the axis of the shear zone between the eddy and the Loop Current were less than 36.5‰. Surface speeds at the current core of the eddy ranged from 2 to 3 knots, as indicated by GEK measurements; representative values are shown in Fig. 1. From dynamic calculation, assuming geostrophic flow, we have obtained maximum geostrophic speeds of approximately 1.5 knots at the sea surface relative to the 1350-decibar surface. Based

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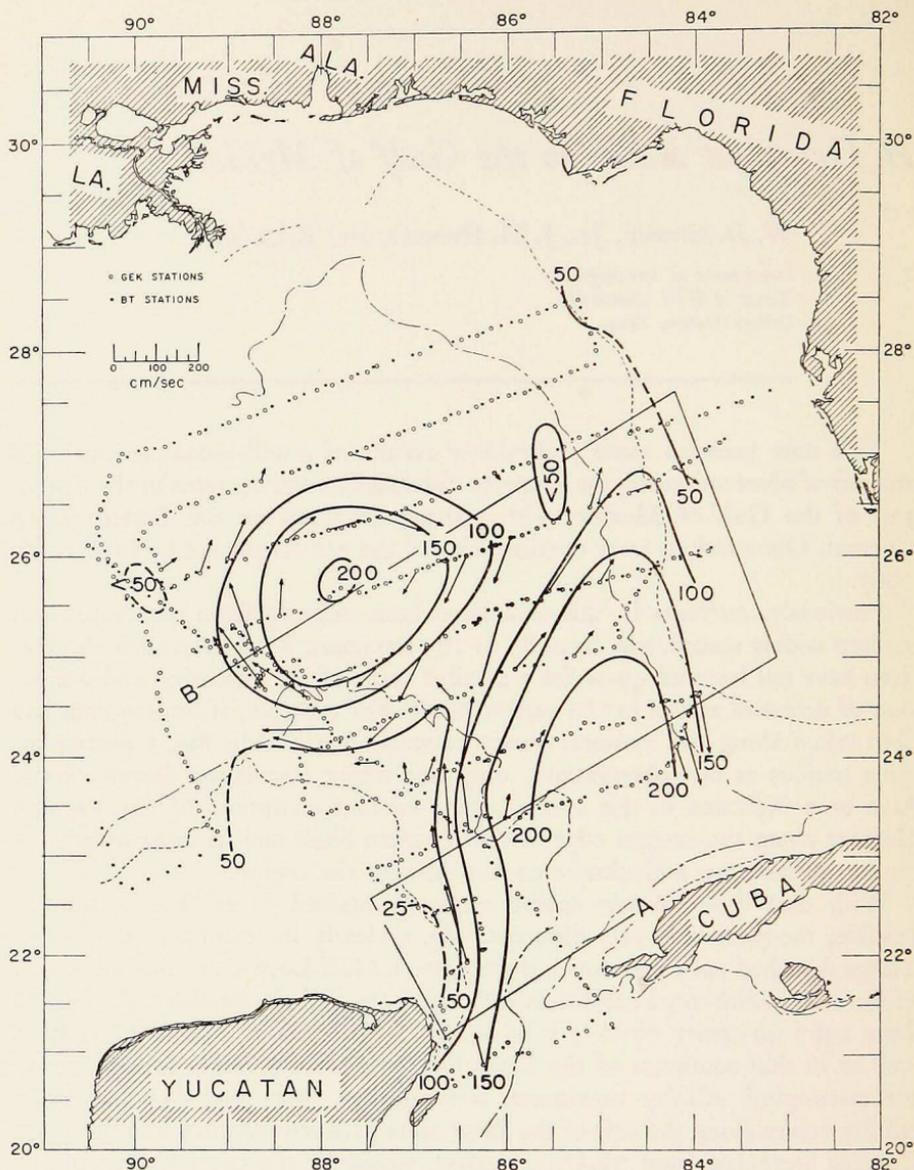


Fig. 1

on repeated crossings along the western edge of the eddy, the position and strength of the eddy seemed little altered during a two-week interval.

We believe that the results of cruise 67-A-4 have, for the first time, provided sufficient data on which to establish positively the existence of a detached eddy in the eastern Gulf of Mexico.