

2004 AGU Ocean Science Meeting

OS09 Gulf of Mexico Processes

Separation of Loop Current Eddy at Gulf of Mexico

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The Yucatan Current enters the Gulf of Mexico from south through the Yucatan Strait. It turns east forming the Loop Current before exits through the Straits of Florida. The Loop Current may extends toward north farther into the Gulf. A large anticyclonic eddy may pinch off from the Loop Current forming the Loop Current Eddy. The Eddy propagates toward the west. The Loop Current and the Loop Current Eddies have significant effect on the circulation in the Gulf of Mexico not only in the deep water but also on the shelf region.

A real-time Intra-Americas Sea Ocean Nowcast/Forecast System which covers the Gulf of the Mexico has been developed and in experimental operation at NRL. Based on its predictions and the satellite remote sensing data: the ocean color, MCSST and the altimeter sea surface height anomaly, we found that the Loop Current Eddy separation process is very complicate. At end of May 2003, the Loop Current have extended farther northward into the Gulf. Over next 2 months, an anticyclonic eddy was twice separated from the Loop Current but each time it re-attached with the Loop Current. Then a small Loop Current Eddy was pinched off from the Loop Current at end of August 2003, and propagated to the west. Finally, at October 2003, after about 4 months from the first separation, a large Loop Current Eddy was separated from the Loop Current. The Loop Current retreated totally to the south before migrated to the north.