Abstract View

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Tracking a Gulf Stream Ring with SOFAR Floats

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ABSTRACT

An experiment to test the feasibility of tracking Gulf Stream rings with neutrally buoyant SOFAR floats was begun in September 1974. Three floats were launched at depths of 750, 1050 and 1080 m in a ring west of Bermuda. One float left the ring after 3 weeks. The other two floats remained in the ring for 2–3 months, while it moved 375 km westward at a rate of 6 cm s^{-1}; they were subsequently entrained by the Gulf Stream off Cape Hatteras. A second ring seeded with floats coalesced with the Gulf Stream and five of its six floats were carried eastward in the Stream. The sixth float drifted south out of the ring and into the Sargasso Sea. One float was launched in the Sargasso between the two rings; its net drift over a 6-month period was to the west at 1.1 cm s^{-1}. These results indicate that there is considerable exchange of water between a ring and surrounding water at depths of 750 to 1100 m and that rings can be tracked for periods of only a few months with SOFAR floats at these depths. Paths of the three floats tracked in the northwestern Sargasso Sea outside of rings and the Stream indicate a net westward drift approximately equal to the observed westward movement of rings in this region.