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Topographically Controlled Mesoscale Flow Anomalies on the Continental Shelf off Southern Sierra Leone and Liberia

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ABSTRACT

Analyses of records from current meters moored on the continental shelf off Liberia and southern Sierra Leone during March and April of 1972 indicate that the flow at that time was dominated by low-frequency oscillations in the near-inertial and sub-inertial range. However, dynamic velocities calculated from hydrocast and XBT data using standard geostrophic approximations were frequently incorrect in both magnitude and sign when compared to the appropriate portions of the velocities recorded by the proximal current meters. Horizontal plots of the topography on isothermal surfaces in areas where the ageostrophic flow was found revealed that the density field there was significantly deformed over small (radius of curvature as small as 2 km) bathymetric elements. Orientation of the principal axis of variance for the current meter records also suggests that the mesoscale flow undergoes strong topographic steering on this low-latitude shelf.

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