



## Abstract View

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## Analysis of Current Observations on the Georgia Shelf

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### ABSTRACT

An analysis is made of HF radar measurements of surface currents in shallow water near the Georgia coast, and also of vertical profile measurements of current and density. The dominant structure is found to be a clockwise ellipse of semidiurnal periodicity, the ellipses becoming smaller, narrower and turning clockwise with depth. There is a definite phase lead of the bottom currents with respect to the upper currents, and some evidence of veering of the currents in the non-Ekman sense. In order to explain the observed vertical variations, a simple analytical expression is developed for periodic rotary currents in a barotropic ocean of constant eddy viscosity and depth  $h$ , when the free-surface elliptic motion is known. The solution depends on the ratios  $\omega/f$  and  $h/h_{\text{Ekman}}$  and also on the sense of turning of the free surface ellipse. The model is able to explain several features of the observed vertical variations as frictional effects.

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