Abstract View

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A Theory of the Mean Flow Driven by Long Internal Waves in a Rotating Basin, with Application to Lake Kinneret

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ABSTRACT

The rectified flow induced by wind-driven internal seiches in a rotating lake is studied. Friction and nonlinearity combine to generate a secondary mean flow which is calculated analytically for the case of a uniform depth lake and numerically for variable depth.

The theory is applied to Lake Kinneret, the former Sea of Galilee, where the diurnal wind forcing produces a large internal Kelvin wave and which has a strong cyclonic mean flow. The uniform depth model reproduces the diurnal response adequately, but variable depth is required to reproduce the mean flow.