



## Abstract View

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## The Zonal Momentum Balance of the Equatorial Undercurrent in the Central Pacific

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## ABSTRACT

Current velocity data from an array of subsurface moorings deployed during the Tropical Instability Wave Experiment from May 1990 to June 1991 are used to diagnose the upper-ocean zonal momentum balance at 0°, 140°W. The flow field and associated zonal momentum flux divergence are fully three-dimensional over the upper 250 m, consistent with the earliest descriptions and theoretical ideas of the Equatorial Undercurrent (EUC). Estimates of the vertical stress divergence show dynamical flow regimes that change between the surface and the base of the EUC, being essentially linear (modified by nonlinearity) near the surface, weakly nonlinear at the EUC core, and fully nonlinear below the core. The vertical stress divergence is much larger over the lower portion of the EUC than previously reported, but this is consistent with the observed downstream deceleration of the EUC and the idea that vertical mixing is important in maintaining the thermostat. Nonlinearity becomes increasingly important with decreasing frequency, but tends to cancel upon vertical integration.

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