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Wind Direction and Equilibrium Mixed Layer Depth in the Tropical Pacific Ocean

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ABSTRACT

The normal equilibrium state of the tropical Pacific mixed layer is explained by the steady state solution for the maximum vertical penetration of oceanic turbulence generated by local atmospheric forcing. The previously overlooked interaction between planetary rotation and the zonal wind stress is believed to increase the vertical turbulent kinetic energy, causing the deep mixed layer in the central and western equatorial Pacific Ocean. The unique conditions of the tropical Pacific provide a test for a revision to the basic equilibrium theory for turbulent mixing in stable oceanic planetary boundary layers.

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