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Evidence of a 4–6 Day Barotropic, Planetary Oscillation of the Pacific Ocean

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ABSTRACT

Spectral analysis of scattered island and coastal tide-gage records from the Pacific Ocean reveals the presence of a coherent sea level fluctuation at 4–6 days period. The oscillation is distinct from baroclinic, inertia-gravity wave fluctuations of sea level at the same periods that are trapped to the central Pacific equatorial zone. Concomitant Spectral analysis of island surface weather data demonstrates that sea level is forced by surface atmospheric pressure but does not respond statically like an “Inverted barometer”. The basinwide character and uniform westward propagation of the oscillation suggest the presence of a barotropic, planetary wave(s). However, the oscillation is strongly attenuated. with an estimated energy e -folding time of less than three days.

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