



Westward sea level anomaly variability in the South Pacific in relation to bathymetry

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Longitude-time plots of merged TOPEX/Poseidon and ERS satellite altimeter data in the South Pacific Ocean are filtered with an anisotropic filter to highlight the westward propagating sea level anomalies, and in particular the long Rossby wave signal. An evaluation of the energy variability of the signal using a Radon Transform technique points to anomalies in the expected sea surface height that are consistent with bathymetric influences on the westward propagation. Results suggest that Rossby waves interact with both ridges and seamounts at various locations across the basin. Anomalously slow Rossby wave phase speeds are found over steep, isolated bathymetric features in the tropical South Pacific and over the plateau around New Zealand. Interaction with ridges increases the variability of dominant propagation speeds and causes meridional deviations in the Rossby wave signal. This observational study is largely exploratory and does not claim to provide unequivocal answers to the dynamic processes behind the observations reported here; nevertheless its findings highlight anomalies that can be tested in future modelling studies.