



## **The dispersion characteristics of westward propagating sea surface height variability**

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The accuracy and 12-year duration of the merged TOPEX/POSEIDON, ERS-1, ERS-2 and Jason altimeter datasets have allowed detailed investigations of westward propagating sea surface height (SSH) variability with high spatial resolution throughout the world ocean. Outside of the equatorial waveguide, analyses of the altimeter data in the space-time domain have consistently found that the observed propagation speeds are faster than predicted by the classical theory for extra-tropical Rossby waves. In this study, SSH variability along a variety of extra-tropical latitudes is examined in the zonal wavenumber-frequency domain to investigate the dispersion characteristics of westward propagating SSH variability. The resulting spectra are sorted according to a nonlinearity parameter computed from hydrographic data and the standard deviation of SSH variability. It is found that the westward propagation in regions of higher nonlinearity tends to be nondispersive over the range of wavenumbers resolved by the SSH fields computed from the merged altimeter datasets. The results are compared with predictions from theories that have recently been proposed to explain the discrepancies between the observations and the classical linear waves.