

Evidence of Rossby Waves Excited by Eastern Boundary Reflection of Equatorial Kelvin waves in the Pacific Ocean

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Abstract

Data from the first five years of the TOPEX/Poseidon mission are used to investigate the reflection of Kelvin waves from the eastern boundary of the Pacific Ocean. Sea level anomaly data from TOPEX/Poseidon are projected onto long equatorial waves. If Kelvin waves are reflecting at the eastern boundary, then their wave coefficients should exhibit high correlation with the Rossby wave coefficients at the appropriate lag. Correlations are performed with the full Rossby coefficients, and also with Rossby coefficients that have had their annual signal removed. It is demonstrated that certain apparent reflections of Kelvin waves may be due to coincidental timing of the Kelvin wave with the normal annual Rossby signal, and not due to the production of intraseasonal waves. The analysis indicates only two examples of intraseasonal Rossby waves produced by reflection of a Kelvin wave at the eastern boundary. The hypothesis is put forward that some Kelvin waves do not reflect due to interactions with easterly winds, which modify their strength and shape.