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Extraction of Mixed Layer Advection Velocities, Diffusion Coefficients, Feedback Factors and Atmospheric Forcing Parameters from the Statistical Analysis of North Pacific SST Anomaly Fields

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ABSTRACT

The statistical properties of observed North Pacific sea surface temperature (SST) anomalies are simulated by a simple mixed layer advection and diffusion model with stabilizing feedback and local stochastic forcing by the atmosphere. An optimal fit of the model to the SST auto- and cross-spectra yields the effective temperature advection velocities and diffusion coefficients in the mixed layer, the local feedback factors and the strength and scales of the atmospheric forcing. The results obtained by model fitting are in general agreement with independent direct estimates, where such data are available. The analysis supports previous models in which the origin of midlatitude SST anomalies on time scales of months to a few years is attributed to stochastic forcing by the atmosphere.

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