



CLIM Program Transition Workshop

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Lecture: *Stochastic Parameterization of Subgrid-Scale Air-Sea Fluxes*

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Abstract:

Fluxes of mass, energy, and momentum between the atmosphere and ocean are parameterized in climate models as dependent on the near-surface wind speed. While what is desired is the flux spatially averaged across a model grid box, the wind information available to compute the flux is the grid box-mean vector wind. In general, the mean of the flux will not equal the flux estimated from the magnitude of the mean vector wind - and the difference between these two quantities is not necessarily a deterministic function of the resolved variables.

To compare the true and resolved fluxes, we have coarse-grained a high-resolution atmospheric simulation over the tropical Indian Ocean and Western Pacific. We will present a characterization of the stochastic dependence of the true fluxes on the resolved variables, both in terms of their local marginal structure and their space/time dependence. Finally, we will discuss implications of these results for the development of stochastic parameterizations in weather and climate models.