

Quantifying Upper Ocean Response to Surface Wind Field Forcing During an MJO

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Abstract: An ensemble of ocean model integrations are driven by fifty realizations from the posterior distribution of surface winds for a selected Madden-Julian Oscillation event. The posterior distribution is derived from an implementation of a Bayesian Hierarchical Model based on: a) NASA QuikSCAT and NCEP FNL data (likelihood distribution); and b) propagating normal modes of the equatorial beta-plane and turbulence spectral models (prior distribution). Using physically realistic realizations of surface forcing associated with the same MJO allows us to quantify, including estimates of uncertainty, the role of a single MJO in setting seasonal distributions of SST and upper ocean heat content at the equator. Similarly, ocean feedbacks to the atmosphere will be inferred to assess implications for an oceanic role in the propagation mechanism for the MJO in the Indian and western Pacific Oceans.