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State, parameter and noise estimation for a coupled ocean-atmosphere model

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We extend previous work on applying Extended Kalman Filter for both model state and parameter estimation in an intermediate, nonlinear, coupled ocean-atmosphere model with synthetic data sets. Current work includes adaptive estimating model-error covariance and assimilating real observational data.

The coupled model consists of an upper-ocean model of the Tropical Pacific and a steady-state atmospheric response to the sea surface temperature. The model errors are assumed to be mainly in the atmosphere, i.e. in the wind stress. Several adaptive strategies for parameterized model-error covariance estimation are tested and compared, and ways to apply them efficiently to state-of-the art coupled ocean-atmosphere GCMs will be discussed.