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State estimation of an intermediate coupled model by the ensemble Kalman filter and smoother

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We report an application of the ensemble Kalman filter (EnKF) and smoother (EnKS) to an intermediate coupled atmosphere-ocean model of Zebiak and Cane, into which the sea surface height (SSH) anomaly observations by TOPEX/POSEIDON (T/P) altimetry are assimilated. Smoothed estimates of the 54,403 dimensional state are obtained from 1,981 observational points with 2,048 ensemble members. While assimilated data are SSH anomalies alone, the estimated sea surface temperature (SST) anomalies reproduce primary temporal characteristics of the actual SST. The smoothed estimate of the zonal wind anomalies is also consistent with the observation except for the westerly anomalies in the western Pacific.