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Observationally Based Estimates of Climate Feedbacks

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Our study focuses hopes to provide constraints to cloud feedbacks in our climate system from assimilation of observations and a radiative transfer scheme. To make accurate projections of future climate, we need to better understand the effect of major physical processes on the climate, especially the transfer of radiation in the atmosphere. We focus our study on the variability of cloud properties in the atmosphere, derived from satellite observations, and calculate the effect that each of these time series of cloud properties has on the output of the Edwards-Slingo radiation scheme. By comparing the observed surface temperature perturbation with the simulated perturbation in net top of atmosphere radiation, we can understand the effect that variability in clouds have on radiative transfer. Using linear feedback analysis, we can estimate the feedback factor for individual elements of the climate system. By better understanding the effect that variability in elements of the climate system has on the net top of atmosphere radiation, we can better constrain the climate sensitivity.