



Understanding Local to Global Cloud Variability from MODIS

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Clouds represent one of the greatest single sources of uncertainty in assessing present and predicting future climate change. The full characterization of the state and variability of clouds on spatiotemporal scales relevant to observed changes in the climate system is still needed. The Moderate Resolution Imaging Spectroradiometer (MODIS) cloud data record brings us closer to a complete picture of global cloud field by providing a stable and consistent view of the entire globe at a resolution of 1km to 250m. We will focus on representing the variability of the cloud vertical and horizontal structure in the MODIS data record using cloud top pressure and cloud amount.

Our analyses covers spatial scales from global trend assessment to local cloud processes over the entire 12 year data record. We report the trends in global clouds composited around cloud types, atmospheric indices and oscillations. We also look at the decadal changes in clouds at regional scales since the beginning of the MODIS data record. Also through compositing clouds at very high spatial resolutions over the full 12 year record we are able to demonstrate the relationship between clouds and local topography, surface features, and meteorological processes. We are also able to determine the impacts on the cloud field and limitations of ancillary data, e.g. surface type, view geometry, atmospheric temperature profile.