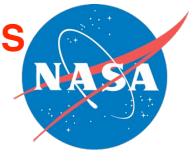




A Detailed Study of Aerosol in the Vicinity of Clouds from MODIS, ASTER and CERES



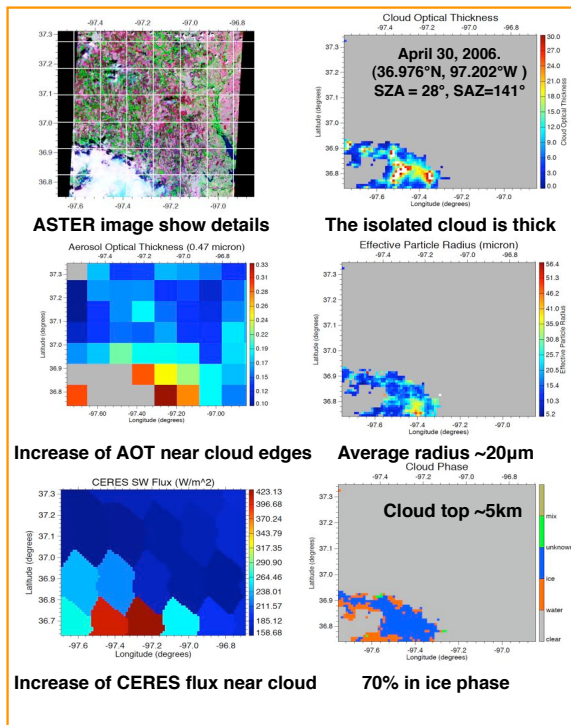
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Executive Summary

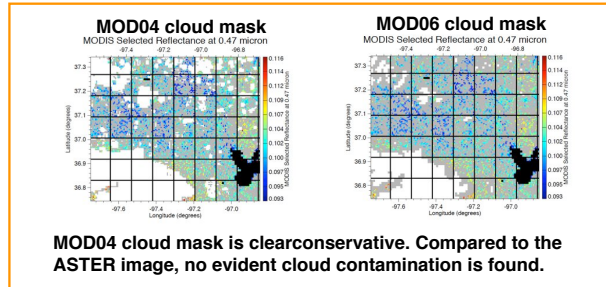
Detailed analyses on a MODIS image collocated with an ASTER and CERES image near the SGP site of the ARM Program include (a) analysis of MODIS AOT, cloud mask, pixels for AOT retrieval; (b) Monte Carlo simulations of 3D cloud radiative effects; (c) using CERES cloud forcing to a simple model to correct cloud adjacency effects. We found:

1. MODIS AOT increases near cloud edges.
2. Cloud-Rayleigh scattering above cloud still a major mechanism for 3D cloud adjacency effects at shorter wavelengths
3. The cloud radiative effects are pronounced within ~10 km to cloud edges. The effects still exist at a distance 30km from cloud edges for 0.47 micron.
4. MODIS selected pixels for aerosol retrieval appear not contaminated by clouds
5. CERES radiative forcing can be used for correcting cloud adjacency effects
6. AOT after the correction still show increases near cloud edges indicating other mechanism responsible.

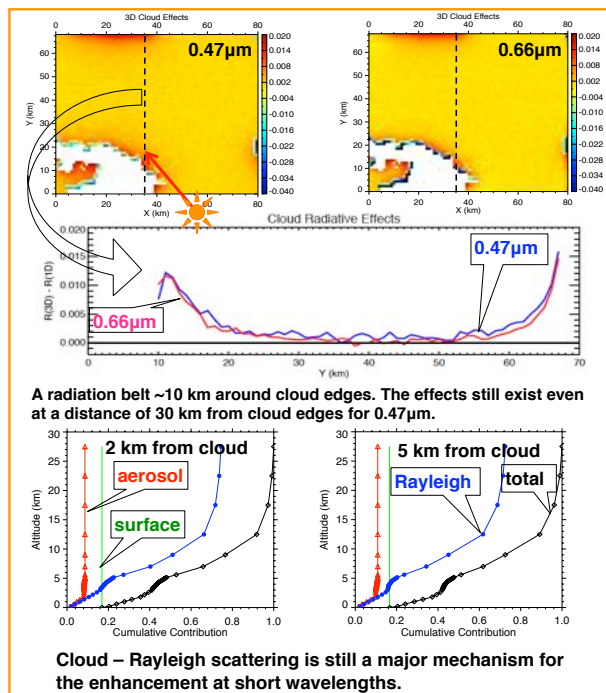
MODIS, ASTER and CERES Observations



MODIS Cloud Mask and Selected Pixels



Monte Carlo Simulations



CERES Cloud Forcing and Correction of AOT

