Assessment of Albedo Derived from Moderate-Resolution Imaging Spectroradiometer at the Southern Great Plains Site

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Summary

The moderate-resolution imaging spectroradiometer (MODIS) bidirectional reflectance distribution function (BRDF)/Albedo product (Schaaf et al. 2002; Lucht et al. 2000) has been produced at 1 km resolution from Terra since March 2000 and as a combined product from Aqua and Terra since July 2002. The retrieval algorithm uses multi-spectral, atmospherically corrected, cloud-free surface reflectances over a 16-day period with a semi-empirical kernel-driven BRDF model to characterize the surface anisotropy and albedo. Only when insufficient sampling of the surface occurs for a full retrieval, is a lower quality backup algorithm used, which relies on a priori estimation of the BRDF based on landcover and season. The entire product time series is about to be reprocessed at a 500-m spatial resolution with improved upstream atmospheric correction and cloud masking (V5). Retrievals will be made every 8 days (based on the last 16 days) to increase the possibility of obtaining high quality results. Initial test results at 8-day and 500m resolution over the ARM Climate Research Facility (ACRF) Southern Great Plains (SGP) site demonstrates consistency with and improvements upon existing (V4) 16-day 1-km products.

This new project will use ARM data for validation of the treatment of anisotropic multiple scattering between surface and atmosphere in applications of the MODIS BRDF/Albedo products. We will tap into the time sequences of measured surface albedo for the SGP site and compare those with MODIS-based estimates that specifically account for anisotropic surface scattering. The focus will be on the effect of anisotropic surface scattering on the diffuse irradiance to determine the circumstances under which a correction for anisotropic effects is required.

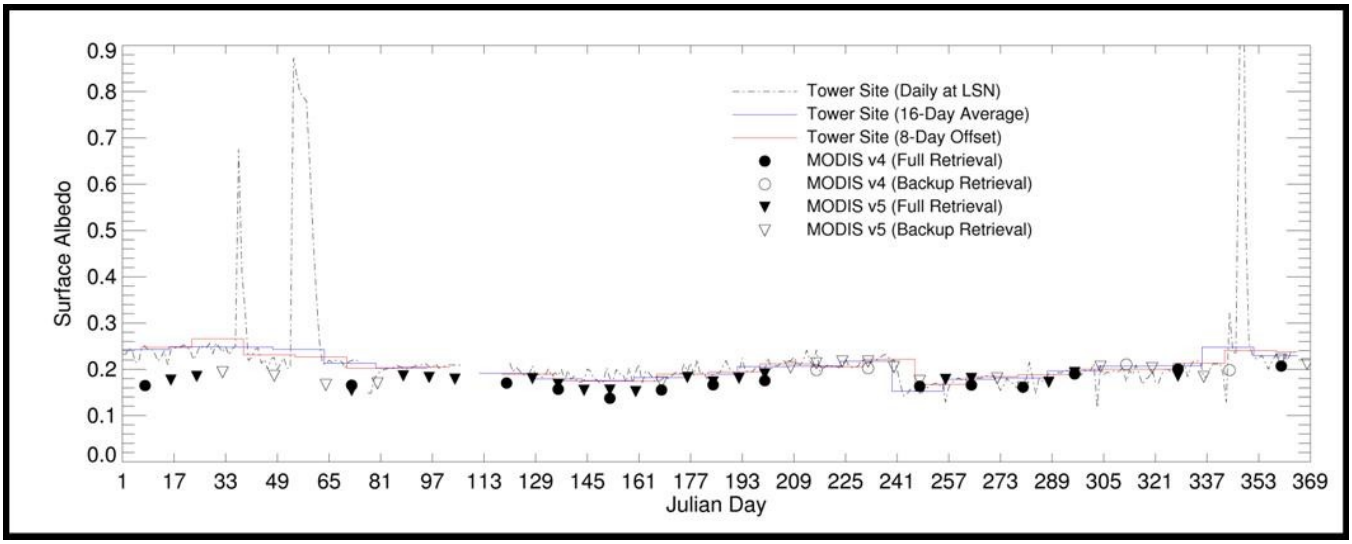

Figure 1. MODIS Albedo Product (V4, V5) over the SGP site (2003)

References

Lucht, W, CB Schaaf, and AH Strahler. 2000. "An algorithm for the retrieval of albedo from space using semiempirical BRDF models." *IEEE Transactions of the Geosciences Remote Sensing* 38, 977-998.

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