

The MODIS Reflectance Anisotropy and Albedo Product: Applications and Enhancements

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Abstract:

The MODIS BRDF/Albedo algorithm has now been providing reflectance anisotropy and albedo data for a decade and these products have been embraced by the scientific community for a variation of applications. The global product is derived by coupling the RossThick-LiSparseReciprocal BRDF model with all high-quality, clear-sky, atmospherically-corrected surface reflectances acquired from both Terra and Aqua over a 16 day period. When insufficient observations are available to sample the surface anisotropy adequately, a back-up algorithm relying on a priori measures of the surface anisotropy is utilized to provide lower quality retrievals. The product routinely provides multispectral anisotropy model information, intrinsic measures of albedo, and nadir BRDF-adjusted surface reflectances every 8 days at 500m, 1km, 30arc-sec and 0.05deg resolutions. The nadir reflectances are used as the primary input to the MODIS phenology and land cover products. Gap-filled, snow-free products are now also being produced and are being used, both as initialization or assessment fields for a number of climate, weather forecast and biogeochemical models and as initial conditions for the retrieval of atmospheric and cloud optical properties. In addition to the operational products, a daily version of the algorithm has been implemented for Direct Readout facilities and this can be used to monitor daily phenological or surface radiation variations. Daily snow albedos are also being produced for cryospheric and hydrologic studies. Extensive field validation exercises and satellite product intercomparisons have been undertaken in recent years under the auspices of the CEOS/WGCV/Land Product Validation effort and these are used to constantly update and refine the product. Plans are underway to begin the sixth reprocessing of the entire data record and a summary of the enhancements envisioned will be presented.

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