



Characterizing the confidence in a gap-free static atlas of monthly averaged BRDF parameters derived from MODIS MCD43C1

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Surface reflectance products albedo and bidirectional reflectance distribution function (BRDF) derived from the Moderate Resolution Imaging Spectroradiometer (MODIS) instrument are widely used in various climate studies needing knowledge of surface reflectance such as land cover, cryosphere, solar irradiance, etc.

A gap-free static worldwide atlas of monthly averaged parameters describing the BRDF has recently been produced by Mines ParisTech using MCD43C1 data averaging over a time period from 2004 to 2011 on a 5x5 km² grid (doi:10.23646/85d2cd5f-ccaa-482e-a4c9-b6e0c59d966c). These maps are particularly easy to work with because of their spatial completeness and fairly low amounts of data to manage. The parameters are available for the ten spectral bands of MCD43C1 and may be used to estimate the surface reflectance for any site, on land and water masses, and any date.

Such a product has nevertheless drawbacks: the descriptions of inter-annual and intra-monthly variabilities of surface reflectance are not documented. This study addresses the differences between the 7-year monthly means of each BRDF parameter and the values available every 8 days in the original MCD43C1 dataset. We analyze the magnitude of those differences, expressed as the standard deviation of the parameter for each calendar month. The approach is applied to cells that offer enough data to ensure statistical significance. We also use a clustering approach to create maps of zones corresponding to different levels of representativeness of the static database. They may help users of the product by providing insights on the degree of confidence with respect to their applications.