



## **Quality assessment and improvement of the EUMETSAT Meteosat Surface Albedo dataset**

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Surface albedo is an important parameter for quantifying and understanding the nature of the Earth's radiation budget. This study describes a comprehensive validation of the EUMETSAT Meteosat Surface Albedo (MSA) Climate Data Record (CDR) currently comprising up to 24 years (1982-2006) of continuous surface albedo coverage for large areas covering Africa, Europe and western parts of Asia. In addition it is discussing retrieval improvements as a consequence of the validation results. The MSA CDR has been generated within a project of the WMO entitled Sustained and Coordinated Processing of Environmental Satellite Data for Climate Monitoring (SCOPE-CM) initiative. The MSA CDR went into a two step validation process. Firstly, the satellite product has been compared to available in situ and satellite data assessing systematic and random deviations among the products. This also included an assessment of the temporal stability over desert sites that are assumed to remain stable over time. Furthermore impact on product quality due to anisotropic effects or snow covered surfaces has been analysed. The evaluation has revealed a number of specific strengths and weaknesses. The long-term consistency is very high and meets the Global Climate Observing System (GCOS) stability requirements for desert reference sites. The limitation in quality appears to be due primarily to clouds not removed by the embedded cloud screening procedure as the most significant weakness of the retrieval process. Two alternative strategies are followed to efficiently improve the cloud detection and removal. The first is based on the application of a robust and reliable cloud mask during the retrieval taking advantage of the information contained in the measurements of the infrared and visible bands. The second, in order to screen out outlier values, relies on a post processing analysis of the albedo seasonal variation together with the usage of "a priori" information contained in a background albedo map. The usage of a reliable cloud mask has a two-fold positive effect on product quality. It enhances the number of high quality retrievals over forest areas sensed under low view angles and removes unrealistic retrievals on similar surfaces sensed under high view angles. As expected it does not have any impact on desert areas. Future releases of the EUMETSAT MSA CDR will include the usage of a more reliable cloud mask.