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Analysis of the stability of bright desert targets with Meteosat observations for future sensor calibration

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Bright desert regions are areas on the Earth surface which are supposed to remain stable from a point of view of the reflectance during long term periods. They can be then used as calibration targets for radiometers on board on space platforms. The Directional Hemispherical Reflectance (DHR) is a physical parameter expressing the reflectance properties of the surface and not depending on the absorption/emission mechanism of the atmospheric components. The DHR is one of the variables retrieved by the Meteosat Surface Albedo (MSA) algorithm developed in EUMETSAT and based on a method proposed by Pinty et al. The MSA algorithm is currently running in the operational reprocessing facility of EUMETSAT in order to generate reliable albedo data set starting from 1982 up to 2006. These data have been acquired by six different radiometers not designed for such applications and the necessary consistency check on their retrieval has been already successfully performed. The processing for the 0 degree mission has been completed and a dataset of 25 years of surface albedo data is available for the users. The strategy for finding stable targets is performed in two steps. In a first stage, targets are identified for their albedo spatial uniformity. Second step is checking the persistency in time of the uniformity, i.e., the temporal stability. This paper will present the analysis of the DHR time series performed on some specific bright desert areas detected for this purpose according to the method just outlined. Results for the complete Meteosat first generation satellite series will be first presented to show the stability of the selected targets and the quality of the retrieval, and then the presentation will focalize on the more accurate platform, Meteosat-7 for the quantitative analysis.
Particular attention will be given to the study of the effect of the seasons on the retrieval and its impact on the calibration activity for future instruments. A comparison with MODIS DHR time series for the same areas will be also shown for evaluation.