Retrieval of a global consistent land surface albedo from geostationary satellites

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Recently, the Global Climate Observing System (GCOS) committee recognized the need for establishing a benchmark for assessing land-surface albedo products and implementing a system for the retrieval of surface albedo from existing and archived geostationary satellites to form a global climatology of albedo for the entire period of available measurements. The effort currently undertaken at EUMETSAT to fulfil the second part of this recommendation will be presented, i.e., the possibility to derive spatially consistent datasets of broadband land surface albedo from different geostationary satellites. For this purpose 10 days of data acquired by GOES-10, GOES-8 and GMS-5 Meteosat-5 and Meteosat-7 have been calibrated and processed to derive surface albedos. The result of processing data acquired by this *ensemble* has been the generation of the first near global map of surface albedo derived from geostationary spacecrafts.

The assessment of the consistency relies on a twofold strategy. Firstly, the calibration consistency among these sensors is verified. To this end, measured top of atmosphere Bi-directional Reflectance Factor acquired at the mid-longitude between two adjacent are compared, accounting for the difference in their spectral response. Secondly surface albedo retrieved over the common area observed by adjacent spacecrafts is compared. The differences in surface albedo are analyzed in the light of the estimated retrieval error, providing thereby an evaluation of this estimated error reliability. The analysis of the surface albedo consistency has revealed a good agreement between the products derived from the various satellites, despite the difference between their radiometers. Broadband surface albedos derived from identical radiometers like the GOES Imager or Meteosat/MVIRI are particularly consistent, with a mean bias not exceeding 2%. Largest biases are observed between Met-5 and GMS-5 due to residual cloud contamination during the processing of data from this former satellite.