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Quality assessment of bidirectional reflectance factor produced using visible imagers on board geostationary satellites.

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Surface albedo is an essential climate variable (ECV) as it has a strong influence on the Earth system climate and weather. Global surface albedo can be derived from geostationary earth observation satellites that provide a unique opportunity to estimate long term data record. Using Meteosat imagery (MVIRI and SEVIRI), EUMETSAT has generated a first release of the Meteosat Surface Albedo Climate Data Record (MSA CDR) from 1982 to 2014. The SCOPE-CM project on land surface albedo from geostationary satellites is coordinating the spatial agencies in Europe, US and Japan in order to generate a near-global CDR using an adapted version of the EUMETSAT MSA algorithm (http://www.scope-cm.org/projects/scm-03/). As a side product of MSA CDR, EUMETSAT is producing geostationary shortwave broadband Bidirectional Reflectance Factor (BRF) using visible imagers on board the METEOSAT satellites (1982-2014), GMS and GOES geostationary satellites (2000-2003). The EUMETSAT BRF dataset constitutes the geostationary input to the global surface albedo product (coupling geostationary and polar inputs) produced by the land part of the Quality Assurance for Essential Climate Variables (QA4ECV) European project (http://www.qa4ecv.org).

This paper presents and discusses the consistencies of each BRF dataset produced using data from the different geostationary imagers. The spatial and temporal extent of these datasets, as well as the cross coverage, yield the possibility to compare the BRF with significant statistical sample size. Variance based methods as well as other statistical tools will be used on the time series to assess the consistency of the BRF within and between the datasets. Strong agreement between instruments are shown in many places, the differences are investigated.