Radiation Products based on a constellation of Geostationary Satellites

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The various components of the surface radiation budget present high variability in time and space, particularly over land surfaces where spatial heterogeneity of the upward fluxes is high. Geostationary satellites are well-suited to describe the daily cycle of downward and upward radiation fluxes and present spatial resolutions of the order of 3-to-5 km at sub-satellite point, acceptable for many applications. The work presented here is being carried out within the framework of Geoland-2 project, and aims the use of data from geostationary platforms to generate, archive and distribute in near real time four component of the surface radiation budget: land surface albedo, land surface temperature (LST) and downward short- and long-wave fluxes at the surface. All four components are retrieved from the following satellites – GOES-W covering North and South America, Meteosat Second Generation (MSG) covering essentially Europe and Africa, and MTSAT covering part of Asia and Australia. The variables are retrieved independently from each satellite and then merged into a single field, with a 5 km spatial resolution. Data are generated hourly in the case of the downward fluxes and LST, and 10-daily in the case of albedo. In regions covered by both GOES and MSG disks, the interpolated field makes use of both retrievals, giving more weight to those with lower uncertainty.

The four components of the surface radiation budget described above are assessed through comparisons with similar parameters retrieved from other sensors (e.g., MODIS, CERES) or from models (e.g., ECMWF forecasts), as well as with in situ observations when available. The presentation will be focused on a brief description of algorithms and auxiliary data used in product estimation. The results of inter-comparisons with other data sources, along with the identification of the retrieval conditions that allow optimal / sub-optimal estimation of these surface radiation parameters will also be analysed.

The radiation products generated within the Geoland-2 project are freely available to the user community.