Improvement in the GERB short wave flux estimations over snow covered surfaces

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Because space-borne radiometers do not measure the Earth's outgoing fluxes directly, angular distribution models (ADMs) are required to relate actual radiance measurement to flux at given solar angle, satellite-viewing geometries, surface, and atmospheric conditions. The conversion of one footprint broadband radiance into the corresponding flux requires therefore to first characterize each footprint in terms of surface type and cloud cover properties to properly select the adequate ADM. In the GERB ground segment as implemented at the Royal Meteorological Institute of Belgium (RMIB) this information (i.e., cloud fraction, cloud phase, and cloud optical depth) is retrieved from the SEVIRI spectral measurements and the IGBP Global Land Cover Map is used to associate one of the five following classes (e.g., ocean, moderate-to-high vegetation, low-to-moderate vegetation, dark desert or bright desert) to each SEVIRI pixels. The SEVIRI pixel registration according to the five classes is taken invariant in time and does not take care of the presence of ice/snow covered areas (permanent snow being assimilated to bright desert surface in the operational version of the algorithm). However snow cover is among the most important of the Earth's surface characteristics that influence surface radiation, energy, and hydrological budgets. Compared to other land covers, its areal extent varies dramatically on very short time scales (hours -months). And while snow is the most isotropic reflector of all natural surfaces on Earth, it still exhibits substantial anisotropy which differs from a bright desert surface. To overcome such a limitation, we present in this contribution a ice/snow retrieval technique from SEVIRI data to be incorporated into the RMIB GERB processing system. Finally, the improvement in the GERB SW flux estimations over snow covered areas resulting from an angular conversion using appropriate snow ADMs is discussed.