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Greenland snow and ice albedo products from Sentinel-3 processed using PolarTEP infrastructure

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Here we present presents daily 500 m horizontal resolution May to October 2017 Greenland snow and ice albedo products from Sentinel-3. The products exploit algorithms from the European Space Agency (ESA) Scientific Exploitation of Operational Missions (SEOM) study: Sentinel-3 for Science (S34SCI), Land Study 1: SNOW. A data processing chain including: atmospheric correction; cloud identification; mosaicing and data quality flagging is presented. Validation is presented: 1.) versus spectral and snow properties observations from Antarctica and the French Alps and 2.) versus broadband albedo versus that from 20 PROMICE.dk automatic weather stations over Greenland snow and bare ice surfaces for year 2017 from May to October. Some of the bare ice surfaces are high in impurities and thus broadband albedo is low (below 0.3). An intercomparison of broadband albedo retrievals with the NASA MODIS MOD10A1 product is also presented. A challenge is developing accurate retrievals for bare ice as opposed to snow cover, for one because snow optical radiative transfer theory are usually not well suited for glacier ice. The year 2017 prototype products are the first Sentinel-3 processing using the ESA Polar Thematic Exploitation Platform (PolarTEP).