

Introduction of the GCOM-C/SGLI Cryosphere product and validation result

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Japan Aerospace Exploration Agency (JAXA) polar-orbit satellite, Global Change Observation Mission for Climate (GCOM-C) which carries Second-generation Global Imager (SGLI) has been launched on 23 December 2017. The GCOM-C/SGLI observes various geophysical variables in the Atmosphere, Ocean, Land and Cryosphere. After starting the test observation since 1 Jan. 2018, we have been investigating calibration and validation aiming to the observation product release. GCOM-C/SGLI regularly creates cryosphere product including Classification product (C1) and Snow properties product (C2). C1 product has focused to cloud mask and surface classification for polar and high altitude region. C2 product has focused to snow and ice physical parameter: snow grain size and snow and ice surface temperature. Snow cover and snow physical properties are signals of global warming and they have strong effects for the albedo variations and radiative balances on the earth surface. GCOM-C/SGLI Cryosphere product will help for understanding the effect for albedo variation, ice albedo feedback and the impact of cryosphere for climate change and global warming. C1 product was validated by comparing other similar satellite product (e.g. Terra/MODIS). In the comparison of snow and ice extent, its accuracy showed under 10% as relative error (defined as quotient of root mean square error and average of validation data). C2 product was validated by in-situ observation results carried out at the E-GRIP site on the North-eastern Greenland Ice Sheet in July 2018. In the comparison of snow grain size of shallow layer, its accuracy showed under 86% as relative error. And after quality check (e.g. eliminating cloud effect using all sky camera), it showed 33% as relative error. In the comparison of snow and ice surface temperature and automatic weather station data, its accuracy showed under 1.5 K as root mean square error. From these validation results, JAXA decided to release the GCOM-C/SGLI product including C1 and C2. And we are planning to continue the validation.