Optical, biological and remote sensing observations at the Issunguata Sermia Glacier, south-western Greenland Ice Sheet, 2018

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The Greenland Ice Sheet surface albedo has declined in recent years. It was reported that the dark ice extent was expanded especially on the edge part of the Greenland Ice sheet from the remote sensing data analysis (e.g. Wientjes et al., 2010, Shimada et al., 2016, Tedstone et al., 2017) and it might have a massive influence for the darkening of the Greenland Ice Sheet. In microscopic point of view, ice sheet surface darkening is mainly caused by dust concentration and microbial activity. On the other hand, in macroscopic point of view, ice surface structure and topographical variations have also important roles for the controlling the albedo. Therefore, comparison of filed observation and remote sensing observation is important for monitoring continuously and understanding of the actual condition on the surface darkening. Our team performed an expedition and conducted the optical, biological and topographical observations at the Issunguata Sermia Glacier (67.10N, 50.66W) in the edge part of the southwestern Greenland Ice Sheet in order to understand the effect of the biological and geographical variations for darkening of the ice sheet. The observation period was from 22 to 30 July 2018. We collected biological samples from the glacial surface and measured spectral reflectance using handheld spectral radiometer (MS-720, EKO). And we analyzed glacial surface conditions derived from GCOM-C/SGLI (Figure 1). In our presentation, we are going to report the detail observation results and the comparison of the remote sensing observation and field observation.

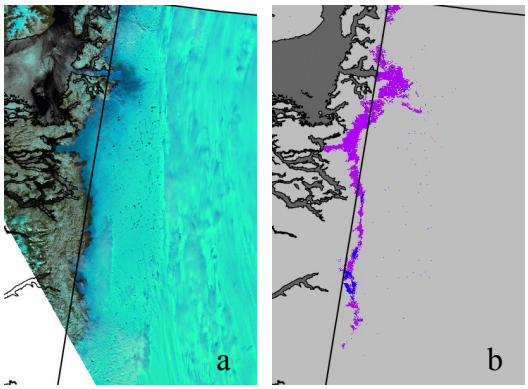

Figure 1. (a) False color image of the south eastern Greenland derived from GCOM-C/SGLI on 29 July 2018 and (b) Bare ice distribution derived from GCOM-C/SGLI from 24 to 29 July 2018.

References

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