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MASS BALANCE ESTIMATION FOR THE HURLBUT ICE CAP IN NORTHERN GREENLAND

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Greenland has large ice mass and its contribution rate to sea level rise by recent warming is large. Saito et al.(2014) revealed by satellite images that the surface level change of some ice caps in northern Greenland is three times as large as that revealed by Bolch et al. (2013). We estimated surface mass balance of Hurlbut Ice Cap (77.2N, 68.4W) in northern Greenland by the mass balance model of Hock (1999). The model shows spatial variation of surface mass balance for each ice caps. The 100m-gridded DEM and surface condition of the ice cap as input of the model were derived from ALOS (Advanced Land Observing Satellite). The climate data as input of the model was global radiation, air temperature and precipitation at Thule climate station which is about 100 km south to the ice caps. The result of the calculation depends on the tuning factor for both accumulation and ablation. The result was compared with the change of the surface height by Saito et al (2014).

¹ Bolch, T., Sandberg, L., Sørensen, Simonsen, S., B., Mölg, N., Machguth, H., Rastner, P., and Paul, F. (2013) Mass loss of Greenland's glaciers and ice caps 2003–2008 revealed from ICESat laser altimetry data. *Geophysical Research Letters*, Vol. 40, 875–881, doi:10.1002/grl.50270, 2013

² Hock, R. (1999) A distributed temperature index ice and snow melt model including potential direct solar radiation. *Journal of Glaciology*, 45(149), 101-111.

³ Saito, J., Tsutaki, S., Sawagaki, T. and Sugiyama, S. (2014) Surface elevation change on ice caps in northern Greenland, *Snow and Ice in Hokkaido*, 33, 77-80. (in Japanese)