

Summer melting observation at the marginal region of Antarctic ice sheet by microwave radiometer

Nuerasimuguli Alimasi¹, Hiroyuki Enomoto^{1,2} and Naohiko Hirasawa^{1,2}

¹National Institute of Polar Research

²Graduate University of Advanced Studies (SOKENDAI)

Antarctic ice sheet is facing the warming and melting conditions, recently. Microwave remote sensing is a useful tool for detecting ice sheet melting. Although 37 GHz, 19 GHz has been used for observation of ice sheet melting, this study used 6 GHz which is available for survey of snow layer and temperature in deeper snow layer.

In-situ microwave observation using portable microwave radiometers were carried out at S17 (608 m a. s. l.) for a continuous observation of one month in January, 2017 (Fig. 1). Spatial variations from S17 to H128 (1376 m a. s. l.) was also observed by traverse observation.

Low microwave emission in non-melting period and significant jump of emission by melting were observed at S17. 6 GHz horizontal polarization was most sensitive to the melting. The jump of 80 K was recorded in the melting case (Fig. 2). Low emission at S17, then soon increase in the inland of S17, but again slight decrease to H128 were observed.

The ice layers in the coastal snow layers seem to cause low emission at S17. Comparison of in-situ data and satellite data showed the general agreements but low TB at S17 was not clear in satellite data.



Figure 1. Microwave radiometers set at the S17 site, Antarctica.

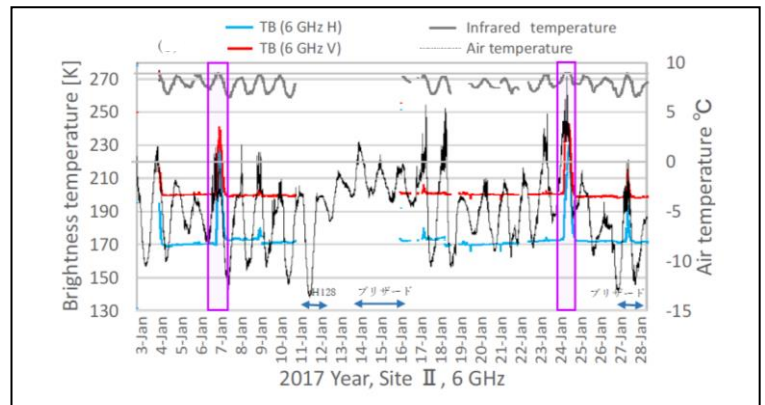


Figure 2. Microwave data observed at the S17 site.