Microwave observation of snow melting, Rain-On-Snow and ice lens formation in polar regions

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This study presents the temporal and spatial variation of ice sheet melting on the slopes of Antarctic and Greenland ice sheets, based on satellite microwave observations. The greatest extent of melting was estimated to have occurred during the 2003/2004 summer. DAV (Diurnal Amplitude variation) rose inland, until the H92 site (1268 m a.s.l). In contrast, DAV decreased in the case of rain This is due to the rise of nighttime brightness temperature (TB) (Fig. 1). This study compares the research in the Greenland Ice Sheet.

This study compares available techiques for detection of melting, Rain-on-Snow (ROS) and ice crust formations in the polar regios (Table 1) . There are several techniques to detect melting of snow and ice by microwave observations. TB increase, DAV ad XPGR (Closs polarizatio ratio)are often used for the research. Recent study also itroduced techniques to detect ROS event by night time TB and GRP (ration og GR (Vpol)/GR(Hpol)) and ice lens/ice crust formation in snow by Low TB and PR (Polarizatio ratio). This study compares those techniques and consider their availability, advantages and disadvantages over terrestrial snow covered region and ice sheets.

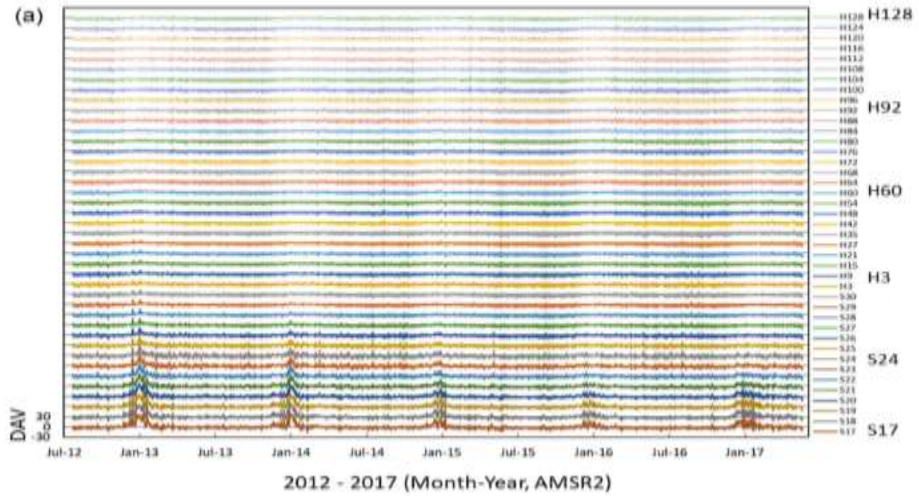

Figure 1. Inlandextent of melting area on Antarctic ice sheet.

Table 1. Snow and ice events and available observation techniques

Event	Retrieve techniques by microwave
Melting	High TB / DAV / XPGR(Closs polarizatio ratio)
Rain on Snow	DAV at night time / GPR (ration og GR(V)/GR(H))
Ice lens/crust	Low TB / PR(Polarization ratio)

References

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