

TEMPORAL VARIATIONS OF PASSIVE MICROWAVES FROM THE ICE SHEET (ABSTRACT)

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This study investigates seasonal variations and spatial differences in passive microwave signals (DMSP SSM/I) from the ice sheet. The time series of brightness temperature (T_b) at 19 GHz and 37 GHz, their gradient ratio (GR: 37 GHz minus 19 GHz) and polarization at each frequency were analyzed. T_b does not reflect simply the air temperature, but it reflects the GR value. The lowest GR is observed in the ridge area of East Antarctica. GR alters its sign with season, that is, it is positive in summer and negative in winter; lower frequency indicates the temperature of the deeper snow layer. However, GR in the ridge area shows negative values throughout the year. Results of the polarization also show distinct seasonal changes between the ridge area and the lower part of the ice sheet. It is concluded that there is high variability of microwave signals along the traverse route between Syowa Station and Dome Fuji Station, which may imply that altitudinal variations of snow characteristics are large in this region.

(Received December 25, 1995; Revised manuscript accepted May 8, 1996)