in which air temperature was warmer than −27°C was 0.25 and that of the cloud in which air temperature was colder than −27°C was 0.45. If the air temperature becomes colder than −27°C, lots of ice crystals will be transformed from supercooled water droplets. According to detailed analysis of inner situation of a cloud, widely ranging values of depolarization ratio can be seen in the cloud. It seems that a region with supercooled water droplets and another region with ice crystals would be formed at the same time because of inhomogeneity of the contents of water vapor or the number density of ice nuclei in the cloud.

(Received June 18, 1986)

DETECTION OF CLOUDS IN ANTARCTICA FROM INFRARED MULTISPECTRAL DATA OF AVHRR (ABSTRACT)

Kazuya SUZUKI[1], Takashi YAMANOUCHI[2], Takeo YOSHINO[1] and Sadao KAWAGUCHI[2]

[1]*University of Electro-Communications, 5–1, Chofugaoka 1-chome, Chofu-shi, Tokyo 182*
[2]*National Institute of Polar Research, 9–10, Kaga 1-chome, Itabashi-ku, Tokyo 173*

A new method to detect clouds without sunlight in Antarctica from infrared multispectral data (channels 3(3.7 μm), 4(11 μm) and 5(12 μm)) of AVHRR on board NOAA-7 is proposed. It is found that clouds can be detected from the difference in the brightness temperature between channel 4 and channels 3 or 5. The brightness temperature difference comes from the difference in the radiative properties of clouds in each channel, which depend on the cloud thickness and microphysical properties. Therefore, classification of clouds is possible from the variation of the temperature difference. Clouds over the snow surface of Antarctica can be detected from the temperature difference of channels 4 and 5. For the cloud detection, the effect of the temperature difference from the difference in the snow surface emittance of channels 4 and 5 is corrected. It is found that the snow surface emittance has the dependence of the snow surface temperature and viewing angle. The effect from the atmospheric transmittance and radiance can be neglected. Ground truth measurements are indispensable to confirm the satellite determination of clouds and to verify the results of radiative properties of the snow surface.

(Received September 1, 1986)

PRELIMINARY ESTIMATION OF HORIZONTAL DIVERGENCE OF DRIFTING SNOW IN MIZUHO PLATEAU, EAST ANTARCTICA (ABSTRACT)

Shuhei TAKAHASHI

Kitami Institute of Technology, 165, Koen-cho, Kitami 090

Horizontal divergence of drifting snow on Mizuho Plateau, East Antarctica, was estimated from ice sheet topography. Since katabatic winds depend on inclination of the surface slope, horizontal distribution of the katabatic wind speed is obtained from the topography. Horizontal distribution of drifting snow and consequently horizontal divergence of the drifting snow are obtained from this