imagery. One method uses only one channel data to interpolate the ice concentration between 0 and 100% corresponding to the open water and the snow cover, respectively. This method yields an uncertainty owing to the variation of albedo by the surface condition change. Another method uses two-channel data to derive not only the ice concentration but also the ice surface condition and can eliminate uncertainties involved in the first method. The ice surface condition is expressed by "snow coverage". Air photographs are compared with the satellite data. They are helpful to discuss the surface condition of sea ice. Time variations of the concentration and surface condition of summer sea ice are discussed.

For detail, the reader may refer to the full paper of this work (YAMANOUCHI *et al.*: Nankyoku Shiryô (Antarct. Rec.), **30**, 89, 1986).

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STATISTIC DISTRIBUTIONS OF MICROWAVE BRIGHTNESS TEMPERATURE OF SEA ICE IN THE MOS-1 AIRBORNE VERIFICATION EXPERIMENT (ABSTRACT)

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Microwave brightness temperatures of sea ice were observed off the coast of Monbetsu on January 25 in 1985 by the airborne 23- and 31-GHz microwave radiometers in the MOS-1 airborne verification experiment. Sea ice map and surface temperature data of sea ice measured by a helicopterborne radiative thermometer were supplied by the Maritime Safety Agency and were used for the ground truth data.

Histograms were produced to show statistic distributions of microwave brightness temperatures at 23 and 31 GHz. Remarkable differences were not found between histograms at 23 and at 31 GHz. Cumulative distribution tables show that microwave brightness temperatures of more than 50% took values higher than 232 and 234 K at 23 and at 31 GHz, respectively. If the average surface temperature value of sea ice, 258 K, is used, microwave emissivity values become larger than 0.9 at 23 and 31 GHz for sea ice of more than 50%. Emissivity value suggests that the greater part of observed sea ice was composed of young ice and thin first year ice. This result is consistent with the ground truth data.

It was verified in this experiment that microwave radiometers of 23 and 31 GHz are useful for observing sea ice.

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PROCESSES OF HIGH-SEA ICE PRODUCTION (II): CONVECTION WITH FRAZIL ICE PRODUCTION (ABSTRACT)

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A semi-permanent area of open water has been frequently observed within the winter sea ice

cover in the polar region. The continuous existence of the open water polynya even in the severe winter shows that two phenomena, namely vigorous frazil ice production and sweeping it away with a strong wind blowing, simultaneously occur there. The open water polynya, therefore, serves as an efficient ice factory much more than the sheet ice growth.

The purpose of this study is to clarify the atmosphere-ocean interaction through the processes of high-sea ice production. Laboratory experiments were performed in which the processes of frazil ice production and the resulting convection were examined as a function of air temperature ($-10\sim-30$°C) and wind speed (2–10 m/s). A plexiglass test tank ($0.4\times2\times0.6$ m in dimension) was filled with salt water (32 permils in salinity) and set in a large cold room. The wind was blowing on the water surface from one side. The convection phenomena in the test tank were observed with a schlieren optical system. The edge position of a frazil ice layer which was accumulated on the lee was advancing against the wind. The processes of frazil ice production markedly changed with wind speed. The higher the wind speed, the thicker frazil ice layer composed of fine crystals formed, whereas at the lower wind speed the thinner frazil ice sheet was advancing windward. The advancing rate of frazil ice layer increased with lowering air temperature but did not depend on wind speed noticeably. The rate of frazil ice production increased with increasing wind speed and lowering air temperature, the wind effect was much larger. At the higher wind speed, a significant amount of supercooled water that formed on the open water surface was efficiently transported into the interior of the water tank through the wind-driven circulation as well as the instability in density, which results in the production of a large amount of frazil ice in the interior of the water tank.

From these experimental observations, it was found that the following four typical regions exist during the processes of frazil ice production; (1) Fast ice sheet (most close to the wind and common ice growth); (2) Open water (region of frazil ice production); (3) Ice edge (brine exclusion mainly occurs in this region); (4) Frazil ice layer (this forms on the lee and is gradually advancing windward).

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GLACIOLOGICAL CHARACTERISTICS OF AN ANTARCTIC INLAND PLATEAU (ABSTRACT)

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Glaciological observations on the high plateau were made along a route of the oversnow traverse by the 26th Japanese Antarctic Research Expedition in 1985. The shape of the dome-like plateau (Valkyrjedomen), which is the second highest in Antarctica, and the position of ice divides have been known more than before. The highest place of this dome was found at 77° 22′S, 39°37′E with an altitude of 3807 m by the use of Navy Navigation Statellite System.

The surface slope, net accumulation, configuration of snow surface, ram hardness, 10 m snow temperature and others were observed. From these results, the characteristics of katabatic winds region were not found in the region higher than the altitude around 3400–3600 m, which