METEOROLOGICAL OBSERVATIONS AT ADVANCE CAMP IN EAST QUEEN MAUD LAND, ANTARCTICA (ABSTRACT)

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Meteorological observations are made at Advance Camp (74°12′S, 34°59′E, 3200 m above sea level) in East Queen Maud Land, Antarctica, from 7 February 1985 to 3 January 1986. The observations included those by a long-term unmanned weather recoder which operated from 1 March to 15 October 1985, with some interruption due to the extremely low temperature below −60°C. The total duration of data amounted to 10 months for the air temperature and 8 months for the wind speed and direction.

The annual mean temperature and wind speed are −43.6°C and 8.2 m/s, respectively, which are estimated from the temperature difference from and the wind speed ratio to those at Mizuho Station. The wind direction constancy (W. SCHWERDTFEGER: Weather and Climate of the Antarctic, Amsterdam, Elsevier, 261 p., 1984) is as high as 0.93 perhaps because of the steep slope (2.7×10^{-3}) in spite of the high altitude. We conclude that this new station is located in the Cold Katabatic region (P. C. DALRYMPLE: Antarctic Meteorology, ed. by M. J. RUBIN, 195, 1966 (Antarct. Res. Ser., **9**)).

Concentrated observations including low-level soundings with radiosondes and pilot balloons are carried out in November and December. Wind spirals up to 2000 m above the ice surface indicated that the wind in the free atmosphere influences strongly the surface wind and that the role of surface inversion is rather small. The surface wind system in the summer seems to be strongly affected by the synoptic pressure systems.

The importance of diurnal activities is also made clear. The height of a diurnal mixing layer reaches about 400 m and the strength of a blizzard is observed to be amplified on the plateau perhaps because of the instability of the surface layer.

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DETERMINATION OF SEA ICE CONCENTRATION FROM AVHRR VISIBLE AND NEAR INFRARED IMAGERY (ABSTRACT)

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Sea ice concentrations are determined from the visible and near infrared albedo of the AVHRR

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