The formative condition of the "Gohei" type is becoming clear by the observations and experiments. (1) There was a rule in the tip angle of the "Gohei" type, (2) the "Gohei" type grew as a part of combination of bullets, and (3) the condition of saturation at the nucleation was at or near the water saturation. Therefore, it was concluded that the "Gohei" type crystals grew from frozen cloud droplets. From these results, it is considered that a polycrystalline snow crystal was defined by their *c*-axes when a cloud droplet was frozen, and if at that time, two prism planes grew and crossed each other at a small angle, their crossing planes grew as "Gohei" type crystals.

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A NUMERICAL EXPERIMENT ON KATABATIC WIND WITH A TWO-DIMENSIONAL AXIAL SYMMETRIC MODEL (Abstract)

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The vertical structure of the katabatic wind and the surface temperature inversion on a clear day in winter are well represented by a two-dimensional numerical model.

An axially symmetric circular continent, which has an elliptic cross-section of 2000 km in radius and 4000 m in height, is supposed, assuming that all variables are uniform along the direction perpendicular to the fall line. Radiative cooling, turbulent transfer and transport of heat and momentum by stationary and transient eddies are included in the model. The time marching method is adopted. The model is integrated for 5 days. Some features of the katabatic wind are well represented. An inversion layer of 24°C in strength and 450 m in height is formed on the slope (inclination is 2.9×10^{-3}); the wind speed is 20 m/s at the height of 70 m, and decreases to 6 m/s at the height of 200 m. Strong wind blows in the layer above which the temperature gradient is very large. An inversion layer of 30°C in strength and 650 m in height is formed on the plateau (inclination is 0.5×10^{-3}); the wind speed is 10 m/s at the height of 30 m.

The surface temperature and the wind profile get almost steady state. However, the atmosphere is still cooling at the rate of 0.4–2°C/day due to radiative cooling; this must be compensated with adiabatic heating by subsidence about 3 mm/s, though it is only 1–2 mm/s in this model. This is a matter of meridional circulation.

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HEAT FLUX IN SURFACE SNOW AT MIZUHO STATION, ANTARCTICA: HOURLY VALUES (Abstract)

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The errors in short term snow heat flux calculation (T. KIKUCHI: Mem. Natl Inst. Polar Res., Spec. Issue, **29**, 61, 1983) are corrected (1) by using the

running average method to infer the lower digit than the accuracy for deep layers and (2) by using a numerical filter to compensate for the difference between the straight line profile and a profile which results from an assumption of constant thermal diffusivity between the two measurement levels for shallow layers. The length of averaging window varies from 3 days at 0.3 m in depth to 15 days at 5 m. The amplitude and phase coefficients of the numerical filter are approximated by $A=1$ ($\omega'<2$), $A=\sqrt{2}/\omega'$ ($\omega'\geq 2$) and $\theta=\omega'/6$ ($\omega'<3\pi/2$), $\theta=\pi/4$ ($\omega'\geq 3\pi/2$), where $\omega'=\omega/\omega_0$, ω being the radian frequency of temperature variations, $\omega_0=2K/d^2$, in which K is the thermal diffusivity and d is the thickness of the layer. Hourly values of snow heat flux at Mizuho Station in 1979 are calculated with the correction. The corrected values are reasonable in order and show coincidence in phase with the net radiation.

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SNOW SURFACE FEATURES OF THE SHIRASE GLACIER DRAINAGE BASIN, ANTARCTICA (Abstract)

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During the glaciological studies of the Shirase Glacier drainage basin in East Queen Maud Land, Antarctica, in 1982, snow surface features were observed along two traverse lines: a 300 km-long north-south line along the streamline of Shirase Glacier from 71°S (1600 m a.s.l.) to 74°S (3200 m a.s.l.), and a 350 km-long east-west line along a 2000-m contour line between Mizuho Station and the Yamato Mountains.

Along the north-south line, sastrugi areas and glazed surface areas existed alternatively at intervals of 20 or 50 km, while the sastrugi was prominent in the lower part of the line and the glazed surface was predominant in the upper part. The alternating presence of sastrugi and glazed surface seemed to correspond to the changing inclination of the ice sheet surface. It is suggested that the sastruga is a depositional feature and the glazed surface is of a long-term erosional form. The difference in surface features can be explained by the change in katabatic wind velocity which is proportional to the surface inclination. Since the drifting snow depends on wind velocity, the horizontal divergence of drifting snow and the formation of erosional surface features will take place where the surface inclination increases. On the contrary, a decrease of surface inclination may produce depositional surface features.

The same correspondence between surface slope and snow surface features was found even along the east-west line, where the frequency of sastrugi was observed by counting sastrugi numbers per 1 km during the pass of an oversnow vehicle for 150 km. A remarkable glazed surface area 60 km from Mizuho Station was located at a place where the altitude decreased to the west. The formation of the glazed surface area is also explained by the drifting snow divergence because the prevailing wind direction is east-southeast and the wind velocity increases to the west with increasing inclination.

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