A FEW FINDINGS RELATED TO THE KATABATIC WIND AT MIZUHO STATION, ANTARCTICA (Abstract)

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To explain the surface wind system of the Antarctic continent, two concepts were presented: One is the "katabatic wind" and the other is the "inversion wind". The physical formulation for the dynamics of the two is almost the same, but the needed parameters are a little different, that is, the former includes the friction stress at the surface. In order to check the applicability of the two theories to the situation at Mizuho Station, the observed upper air data were used to see how these theories can explain the wind speed and the wind direction at the surface level. The concept of "katabatic wind" showed a better result for the wind speed and nearly the same result for the wind direction. The concept of "katabatic wind" is more applicable to the wind at Mizuho Station.

The katabatic wind theory includes the interrelation of four factors, that is, the pressure gradient force of the synoptic scale and the inversion layer, the height of the inversion, the wind speed and the deviation of the wind direction from the fall line. However, this theory cannot determine explicitly the height of the inversion layer which is proportionate to the height of the katabatic wind at a certain site. This means that there is still some room for improvement of this theory. The key seems to exist in the incorporation of the subsidence flow and the drainage area. A simple model was established by taking these into consideration.

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ON THE CALCULATION OF SENSIBLE HEAT FLUX NEAR THE SURFACE AT MIZUHO STATION, ANTARCTICA (Abstract)

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The study of the heat balance at the snow surface was one of the main themes of the Japanese POLEX-South program (1979–1981). Among the heat balance components, the ones which involve the direct contact of air at the snow surface are the sensible heat and latent heat. Measurement of vertical sensible heat flux by eddy correlation method using the ultrasonic thermo-anemometer, did not work out well for the full observation period. Therefore, an alternative method using the vertical profile data of air temperature and wind speed, had to be constructed. If the non-dimensional universal functions $\phi_M = kz/u_* \cdot \partial U/\partial z$ and $\phi_H = kz/\theta_* \cdot \partial\theta/\partial z$ can be determined, the sensible heat flux can be obtained from the observed data. ϕ_M and ϕ_H were obtained for stable region. However, ϕ_M and ϕ_H at Mizuho Station differed much from the ones obtained in the past, such as the one shown in BUSINGER *et al.* (J. Atmos. Sci., **28**, 181, 1971). The reason