The Influence of Snow Cover for the Mountain Phenomena on Mt. Norikura

*Genki Uehara[1], Motoshi NISHIMURA[2], Akihiko SASAKI[3], Keisuke Suzuki[4]

1. Graduate School of Science and Technology, Shinshu University, 2. Interdisciplinary Graduate school of Science and Technology, Shinshu university, 3. Department of Geography and Environmental Studies, Kokushikan University, 4. Department of Environmental Science, Faculty of Science, Shinshu University

Japan's spinal mountains are one of the rarest snowy regions in the world, and snow is one of the important factors in mountain environments. However, since the weather observations in mountainous areas in Japan are insufficient, the actual state of mountain weather itself has not been fully clarified, and there have been few examples focusing on snowfall and local mountain weather. Therefore, we performed year-round meteorological observations and snow depth observations at Mt. Norikura in the southern Northern Alps, clarified the characteristics of the prevailing weather and its seasonal changes, and examined the effects of snow on it.
As a result of wind direction and wind speed observation at 1450 m above the eastern slope (Norikura st.), The following two types of daily changes were observed. (1) Diurnal variation in which a rising slope wind blows in the daytime and a descending slope wind blows in the nighttime (summer style wind system). It is a diurnal variation (spring-type wind system) where a downhill wind blows. Mainly, the spring-type wind system is dominant from winter to spring, and the summer-type wind system is dominant from summer to autumn. The transition from the spring-type wind system to the summer-type wind system changed abruptly within a few days, and the timing corresponded to the snow disappearance at the upstream point of the valley. When there is a relatively warm atmosphere on the snow surface, the downward sensible heat transport drives downhill winds. It is considered that a wind system is formed in which the slope downwind developed in the upstream part of the valley works predominantly after noon when the temperature difference between the air temperature and the snow surface temperature becomes large. Furthermore, the results suggest that this downhill wind may have a function of assisting the penetration of general wind (mainly west wind) into the valley on the eastern slope. In addition, an investigation of the temperature distribution along the valleys on the eastern slope revealed that local low-temperature air masses were formed during the day on a part of the slope around May. Became clear. The formation of the periodic warm-air mass also corresponds to the snow cover in each year, which is considered to be the cooling effect of the snow cover. Furthermore, the results suggest that the low-temperature air mass flows downstream of the valley, maintaining the spring-type wind system even when the snow surface shrinks.

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