The influence of snow for the local wind system on the east slope of Mt.Norikura

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On the east slope of Mt.Norikura (3026 m), there is a unique local wind system, which is thought to be influenced by the snow on the slope. In general, on the mountain regions, the nocturnal flows are down-slope and down-valley wind, while the daytime flow are up-slope and up-valley wind. However, in the Mt.Norikura on the winter-spring, the down-slope wind develop afternoon even though daytime. It is a unique local wind system. The snow on the slope of mountain is possible to play a role in the development of the unique wind system. Because a temperature of a snow surface is always near or below 0 ˚C, a downward sensible heat be formed whenever the air temperature is above 0 ˚C. The air over snow that has been cooled by a downward flux of sensible heat produce the down-slope wind in especially the late afternoon of warm, sunny days (Whiteman, 1999). We consider that the unique wind system is formed with the result of the interaction between “down-slope wind on the snow” and “up-slope wind on the no-snow surface“.

Japanese Alps including the Mt.Norikura is known as a heavy snow region, a lot of snow falls on the mountain region in winter (Suzuki, 2013). The snow surface forms a characteristic thermodynamically structure and plays important roles in the atmospheric environmental of mountain regions. However the atmospheric environment of mountain regions have not been understood sufficiently due to insufficiency of meteorological observation. In this research, We will report the relevance between a local wind system and snow on the mountain region with using the data of meteorological observation.

Keywords: mountains meteorological, thermally driven wind, snow

