**Vertical Profiles of Mass Flux For Different Particle Diameters in Drifting Snow Over Hard Snow Surfaces**

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The vertical profile of horizontal snow mass flux is a fundamental structure of drifting snow. It is widely recognized that most of drifting snow particles are transported within the saltation layer near the snow surface. However, little is clarified about the dependencies of the vertical mass flux profile in the saltation layer on conditions such as snow particle diameter, snow surface hardness, etc.

In this study, cold wind-tunnel experiments were carried out to measure vertical profiles of mass flux for different particle diameters over hard snow surfaces. Compacted snow was sieved to make a flat snow bed on the floor of the wind-tunnel. The snow bed was left for a night to become hard enough, by sintering, not to be eroded by drifting snow particles. Mass flux measurements in drifting snow by a snow particle counter showed that mass flux at each particle diameter decreased exponentially with increasing height. Previous studies showed that saltation height decreased with increasing particle diameter over loose snow surfaces. On the contrary, present study showed that saltation height increased with increasing particle diameter over hard snow surfaces. This opposite dependence is probably due to differences in particle collision processes on the loose and hard snow surfaces.