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Experimental investigation of drifting snow in a wind tunnel PHILIP CRIVELLI, ENRICO PATERNA, STEFAN HORENDER, MICHAEL LEHNING, SLF Davos — Drifting snow has a significant impact on snow distribution in mountains, prairies as well as on glaciers and polar regions. In all these environments, the local mass balance is highly influenced by drifting snow. Despite most of the model approaches still rely on the assumption of steady-state and equilibrium saltation, recent advances have proven the mass-transport of drifting snow events to be highly intermittent. A clear understanding of such high intermittency has not yet been achieved. Therefore in our contribution we investigate mass- and momentum fluxes during drifting snow events, in order to better understand that the link between snow cover erosion and deposition. Experiments were conducted in a cold wind tunnel, employing sensors for the momentum flux measurements, the mass flux measurement and for the snow depth estimation over a certain area upstream of the other devices. Preliminary results show that the mass flux is highly intermittent at scales ranging from eddy turnover time to much larger scales. The former scales are those that contribute the most to the overall intermittency and we observe a link between the turbulent flow structures and the mass flux of drifting snow at those scales. The role of varying snow properties in inducing drifting snow intermittency goes beyond such link and is expected to occur at much larger scales, caused by the physical snow properties such as density and cohesiveness.

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