



Snow chute experiments to investigate dynamic avalanche forces for snow shed design

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Snow sheds are used in alpine regions to protect transportation routes from avalanches. They are massive structures that must withstand both the static and dynamic forces from snow avalanches. Static forces arise from the snow cover and when avalanches, or other debris, come to rest on the roofs of the shed. Dynamic forces arise from shear stresses exerted by dense avalanches as they pass over the roof. It is often difficult to define the design load as well as the correct length of these structures and therefore practical design procedures are required. In this contribution we introduce the methodology of force measurements on our large-scale experiments with snow at the Weissfluhjoch chute. Furthermore we present the results from a series of experiments pointing out the distribution of forces after a deviation on slope inclination. We deduce the kinematic coefficient of friction and interpret the rheology of the flow. Velocity- and force measurements let us provide an estimation of the energy dissipation at the sliding surface and in the flow. Those results will let us establish an experimental basis for snow shed design.