



Failure of weak snow layers

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Dry-snow slab avalanches start with a failure in a weak layer below a cohesive slab. Avalanche release models start with an initial crack which may propagate and, depending on the slope angle and the roughness of the fracture surface, lead to a whumpf or an avalanche. In order to investigate how the initial failure forms, we performed loading experiments with typical weak layers (surface hoar and depth hoar). We found that surface hoar strength decreased with loading rate and slope angle, i.e. increasing shear component of the load. For depth hoar increasing loading rate also decreased strength while the effect of the loading direction was less prominent. Possible consequences for slab release are discussed.