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# PLASTIC EFFECTS IN SNOW FRACTURE TOUGHNESS MEASUREMENTS

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Dry snow slab avalanche release is preceded by a shear failure along a weak layer or interface in the snowpack, followed by a fracture in tension. These are both fracture mechanical processes. For a better understanding of the slab release process measurements of the relevant snow mechanical properties, e.g. fracture toughness, are essential. Previous measurements on snow fracture toughness were performed with relatively small specimens and analysed based on linear elastic fracture mechanics. Several problems, like dependence of fracture toughness on cantilever length which indicate a dependence on specimen size were identified. We assume that linear elastic fracture mechanics is not appropriate to the performed experiments, in particular, because the plastic zone around the crack tip is too large in relation to the specimen size. An expansion to elastic plastic fracture mechanics seems inevitable. To evaluate our experiments we applied the so-called R6-method. The main item of this method is the failure assessment diagram (FAD) which describes the interaction between crack instability and plastic collapse of the remaining unbroken area of the test specimen. This approach leads to improved values for mode I fracture toughness. More realistic values for fracture toughness are of great importance for slab release models. Snow fracture mechanical parameters will be needed to improve snow slope stability evaluation by considering the fracture propagation propensity.