

The effect of additional snow load on extended column test and propagation saw test results

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The number of skier triggered dry slab avalanches typically increases during or shortly after snow loading events. However, field observations and research suggest that a skier is less likely to trigger a weak layer fracture as the depth to that weak layer increases. This begs the question: Why does skier triggered avalanche activity increase when the likelihood of initiating fracture seemingly decreases? This paper presents preliminary evidence that new snow loading may decrease the chances for fracture arrest once initiated. During the winter of 08/09 in Colorado's continental snowpack we used Extended Column Tests (ECT) and Propagation Saw Tests (PST) to track changes in the snowpack's ability to propagate fracture before and after loading events. In addition, we present two case studies from Southeast Alaska's maritime snowpack. We used Extended Column Tests to measure the amount of additional loading required for a fracture to cross the entire column (ECTP). We compared these measurements to the natural loading at the end of the loading event and a day after the precipitation stopped. We also compared our data to avalanche activity on the same slopes. Our results suggest that in some cases the snowpack's propensity for fracture arrest decreased with the additional loading, and that artificial loading of an extended column may be a useful tool to estimate loading thresholds for full fracture propagation.