

On surface warming and snow instability

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Warming is believed to be one of the most prominent causes of snow instability – although experimental evidence is rare. We know that – due to the low thermal conductivity of snow – warming at the snow surface rarely affects the weak layer temperature. In the case of dry-snow slab avalanches, instability is not due to weakening of the weak layer, but is believed to be due to increased deformation within the near-surface layers of the slab. Solar radiation can penetrate the surface and effectively reduce the stiffness of the upper layers. Changing slab properties directly affect snow instability in many ways. Whereas measurements have shown that the surface layers in fact creep more rapidly due to warming, field evidence is mostly lacking on how these changes affect snow instability. This might be because the effects of surface warming are subtle and/or only observable under certain slab/weak layer conditions.