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Terminology and predominant processes associated with the formation of weak layers of near-surface faceted crystals in the mountain snowpack

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ABSTRACT. Although recent observations indicate that weak layers of near-surface faceted crystals are widely associated with snow avalanches, little research has addressed these layers. Further, current research has been hindered by an absence of a framework with which to discuss their formation. This paper proposes terminology and describes three predominant processes observed in mid-latitude mountains which result in extreme near-surface temperature gradients, thereby forming near-surface faceted crystals: radiation recrystallization, melt-layer recrystallization, and diurnal recrystallization. It is hoped that this framework will improve scientific discussion and theory-building related to the formation and spatial distribution of near-surface faceted crystals.