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Equivalent density of weak interfaces estimated by the shear strength of snow

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For avalanche forecasting with the SNOWPACK model, shear strength of snow layer is estimated as a function of density using expressions for different grain types, but there is no way to estimate shear strength of weak interface of two different snow layers. In this study, at first, shear strength of weak interface was measured using a shear frame with an area of 0.025 m2, then an imaginary density was calculated from the measured shear strength using the expression for snow on the equi-temperature metamorphism, which was proposed by Yamanoi and Endo (2002). This imaginary density illustrates microstructure of the weak interface, then was named to equivalent density of weak interface. Finally, the equivalent density of weak interface was compared with that of upper and lower snow layers onto the interface. The equivalent density of weak interface has a strong relationship with density of the upper snow layer. This relationship will be applied to estimate the shear strength of weak interface.

Keywords: avalanche forecasting, shear strength of snow, weak interface