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Snow shear strength under different stress rates and avalanche release

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The results of an influence of additional high rate shear and normal stresses on shear strength of snow samples in stressed conditions (subjected constant shear stress) have been submitted. The field experiments have been carried out in the Khibini Mountains (Russia) and laboratory ones in Shinjo Cryospheric Environment Simulator (Japan). An effect of oscillation of the stresses on shear strength and avalanche release has been considered. An effectiveness of the influence of low and high rate stresses on the shear strength is compared. High rate stresses are significantly more effective for avalanche release. Different mechanisms of snow instability appearance caused by different types of short term loadings are considered. An interpretation of shear frame tests for snow stability assessments is suggested. A snow block model for slab avalanche release taking into account long term loadings (caused by snowfalls) and short term ones (caused by seismicity or air shock wave) has been described.
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