

## Snowpack-stability related vibration experiments

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We would like to present some interesting preliminary results obtained during experiments related to earthquake-induced avalanches and held at the Cryospheric Environmental Simulator of the Shinjo Branch, Snow and Ice Research Center, National Research Institute for Earth Science and Disaster Prevention (Japan). By using double-degree-of-freedom (vertical and horizontal components of acceleration) shaking table (constructed by K. Shinbori, ILTS, Hokkaido University) and artificial snowpack with a weak layer (so called *sandwich* snowpack) two series of tests were conducted and filmed. Oscillations of shaking table with a snow block on it produced stresses within the snow stratum and led to a fracturing. Peak accelerations and main snow properties were measured and used for calculation of principal stresses. In result, for earthquake related shaking (strong ground motion) we could show the importance of snow mass, shear and tensile stresses (along and normally to shear plain accordingly). It was suggested that not only shear stresses, but tensile stresses normal to shear plain could be important for fracture nucleation. Such behavior is unique and uncommon type of fracturing since 1) tensile forces perpendicular to shear plain cannot be caused by other natural processes except earthquakes and 2) snow, as one of the most brittle materials, is very weak in tension. Further experiments with shaking table producing similar to real earthquakes vibrations and FEM modeling are under discussion presently.