

## **Experimental analysis of snowpack effects induced by blasts**

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An experimental snowfield has been realized in Gressoney La Trinité (Italy) to analyse the response of snowpack to explosives and the induced artificial triggering of avalanches. Two different explosives have been tested (dynamite and emulsion); 24 charges were separately detonated at different elevations from the snowpack (on the snow surface, at 0.5 m, 1 m, and 0.5 m below the surface). The aim was to define the relationship between charge and delay, elevation and air blast. The energy propagation from blasts on the snowpack and the air blast were monitored by passive seismic sensors and sound devices, respectively. The geophysical investigation of the test site (georadar and seismic) was aimed to i) estimate the mechanical properties of the snowpack; ii) detect changes of the snowpack properties before and after the blasts. The georadar survey has permitted to estimate the snowdepth in the range of 0.6 to 1.5 m; the snow density has been evaluated by the conversion of the electromagnetic wave velocity using mixing rules; the density is in the range of 200 – 300 kg/m<sup>3</sup>. The analysis of the craters induced by the different blasts has been performed; the correlation between the crater parameters and the passive seismic and sound data collected in different fixed stations permitted to assess the blast performances. The results agree with previous studies, especially as far as the geometry of the craters obtained from different blasts is concerned.