



Study of seismic signals generated by explosions triggering avalanches.

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Our group is dedicated to the study of the seismic signals generated by avalanches. Through several years deploying seismic stations at the Vallée de la Sionne (VDLS) test site in Switzerland (operated by SLF) it has gathered a large amount of seismic signals forming a database. The database consists mainly on signals generated by snow avalanches descending the VDLS test site. However, signals corresponding to the explosions that triggered the avalanches and even earthquakes are also included in the database. Depending on the snowpack stability, some of the explosions, despite being of the same charge, are unable to trigger an avalanche. The explosion signals are recorded in 3-component seismometers placed at two or three sites separated a maximum distance of 2.5 km approx. from the release area of the avalanches.

The seismic signals corresponding to the explosions recorded at different sites are analyzed and their characteristics compared. Amplitude and frequency content of the displacement, velocity and acceleration of the generated waves traveling into the ground and those of the blast (air) are calculated. These values are compared with those of the waves generated by avalanches and other seismic sources (earthquakes, helicopters, airplanes).

These analyses allow us to quantify and evaluate parameters related to the possible triggering of secondary snow avalanches caused by the generated vibrations in air and ground. The results are related to the weather and snowpack conditions, when it is possible.