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Infrasonic and seismic signals of snow avalanches and debris flow

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Infrasonic and seismic signals generated by debris flows and snow avalanches are observed by microphones and seismometers, respectively, in near field. The properties of the signals obtained are presented. For debris flows, infrasonic and seismic signals are correlated and their amplitudes show a relationship with flow depth and precipitation data. During the passing of a debris flow several surges identified by ultrasonic gauges are observed in the time series and in the running spectra of infrasonic and seismic data. Both sensors detect the debris flow phenomena before reaching the sensors.
Analyses in the time and frequency domains of seismic and acoustic signals from snow avalanches provide information on these natural phenomena. Although time series behaviour of infrasonic and seismic waves is similar, the time series present some differences in the information supplied. Complementarity and peculiarities of the use of these sensors for monitoring purposes are discussed in the paper. During the execution of this study infrasonic signals emitted from helicopters, airplanes and thunder were also identified and are presented