Infrasound monitoring of snow avalanches activity in the Italian Alps

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Risk assessment of snow avalanches is mostly related to weather conditions and snow cover. However a rigorous risk validation is required to identify the whole avalanche occurrence, in order to compare predictions to actual events. For this purpose we installed in December 2009 a temporary 4-element, small aperture (150 m), infrasound array in the western Alps. The array has been positioned south of Mt. Rosa, at an elevation of 2000 m a.s.l. in the valley of Gressoney, where natural avalanches are expected and snow-clearing operations are regularly programmed. A multi-channel correlation (MCC) analysis is carried out on the continuous data set as a function of slowness, back-azimuth and frequency of recorded infrasound, in order to detect all avalanches occurring above the back-ground signal, strongly affected by microbarom and mountain induced gravity waves. Here we present results from the 5-month-long experiment (Dec 2009 – Apr 2010). Despite the low avalanche activity during this winter season, hundreds of pressure transients possibly produced by avalanches have been detected. Eventually, daily detections are combined with meteo-nivometric data, with the purpose of validating both the efficiency of this pilot experiment in Italy and the validity of avalanche-risk assessments.
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KEYWORDS: infrasound monitoring, infrasound array, avalanche

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