

Locating snow avalanches by using of infrasound array data

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Infrasound observation measures the energy radiated by the snow avalanche in the atmosphere and is able to detect snow avalanches over large areas. The use of infrasound for snow avalanche monitoring has increased in the last decades, with significant improvements on snow avalanche dynamics research.

Our research team has conducted infrasound observation in the last 3 winter seasons in Tokamachi, Niigata. Firstly, we deployed an infrasound sensor in front of the specific slope between Jan. and April 2013 with visual observation by using a web camera and grasped infrasound signals characteristics generated by snow avalanches. And in the second season (2013-2014 winter season), we deployed two infrasound sensors with about 1 km distance and caught the distance attenuation characteristics of infrasound signals. In the last 2014-2015 winter season, we deployed 3 sensors with a triangular geometry spaced 1 to 2 km apart and tried to extract signals associated with snow avalanches from observed raw data automatically by using time domain processing. And for extracted signals, locations of snow avalanches were estimated by using cross-correlation method. 12 events were picked up and located. Estimated locations were in the area with many steep slopes. Infrasound array monitoring system with real time processing might deliver significant information on snow avalanche activity to us.

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