

Array Observations of Avalanching Glaciers

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Ice avalanches constitute severe natural hazards, threatening human lives and infrastructures, and are expected to increase with ongoing climate change and population pressure forcing settlements into exposed terrain. In Europe, costly monitoring programs have also highlighted changing glacial hazards. Consequently, monitoring and warning systems, which help mitigate the threat and impact of mass movements are a key component of hazard management in mountainous regions worldwide.

In this study we show how infrasound arrays are able to detect and locate ice collapses from a glacier front and under specific conditions might allow to provide an estimate of the source volume. This study focuses on small scale (< 10.000 m³) ice collapses as recorded by local (< 2 km far) arrays, and fluid-dynamics based estimates of ice volumes inferred from infrasound are compared with independent measurements to validate theoretical estimates and to define experimental relations.

These results show how infrasound array observations may provide successfully quantitative information of glacier collapses and ice avalanche volumes, thus opening new perspectives for monitoring avalanching glaciers and providing warning for break-off events.

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Promotional text

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Oral preference format

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