

signals generated by production blasts in a nearby quarry

Tuesday, 5 November 2024 11:40 (25 minutes)

The infrasound array ISCO was installed 2021 on the grounds of the Conrad-Observatory in Austria. Since 2022, a large number of signals caused by production blasting in a nearby quarry have been recorded and analysed. The aim of this study is to reveal source and Green's function of the observed signals. We start from the hypothesis that the interaction of the rock masses with the atmosphere is the source. Photogrammetric models provide quantitative data for this study. Videos qualitatively convey the entire blasting process. Using numerical modelling, we determine the temporal change in the volume of the rock masses from detonation to final deposition.

The dominant wavelength of the observed infrasound signal is ~500 m, which is well above the dimensions of the blast site. We therefore consider the temporal course of the entire process as a 1D-process. We test source functions based on the direct effect of the time-delayed detonations. The evaluation criteria of the respective source function is the shape of the Green's function. The source function based on the pulsating sphere model is the one that produces a physically interpretable Green's function. The convolution of these source and Green's functions describes the shape of the signal very well.

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Session Classification: Modelling and Network Processing

Track Classification: Modelling and Network Processing