
S014-07 - Analyses of Seismicity at Etna Volcano, Italy, using Rotational Sensor Data

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 14:56 - 15:00

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Abstract

The field of rotational seismology has only recently emerged. Portable 3 component rotational sensors are commercially available since a few years which opened the pathway for a first use in seismology and volcano-seismology. While the field is growing and first instrument tests are completed, it has been found that one rotational sensor can in combination with a single seismometer be used to identify and filter for specific seismic wave types, to estimate the back azimuth of an earthquake and to calculate local seismic phase velocities.

Our work focuses on the comparison of translational with rotational data and additional analyses of the latter at Etna volcano in Italy. A continuous full seismic wavefield of 30 days was recorded by a BlueSeis-3A, the first portable rotational sensor, and a broadband Trillium Compact seismometer located next to each other at Mount Etna in August and September 2019. In this study we created an earthquake catalog containing volcano-tectonic and low period events using translational or rotational data as well as the combination of both. We applied the STA/LTA picker implemented in the python based pyrocko package along with cross-correlations and spectrograms to verify picked events. To further analyze these events the back azimuths were calculated using various methods based on rotational motions. The findings of this study can be used to evaluate the benefits of rotational sensors on volcanoes.

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