

Properties of the high-frequency ambient seismic field recorded on a large-N (N=10,530) seismic deployment in the Vienna Basin

The Vienna Basin is the largest petroleum basin in Austria. As part of the ongoing seismic exploration for hydrocarbon resources in the basin, a large-N (N=10,530) dataset of continuous seismic recordings of the ambient seismic field was acquired in early 2018. Data were recorded on geophones (10-Hz corner frequency) and each location was made up of 12 or 24 densely clustered geophones, which were stacked to increase signal-to-noise ratio. Data were collected by these geophone clusters for up to 6 days, recorded only during day time. The station locations are distributed on a grid of roughly 40m by 400m and cover an area of about 500km². Here, we present the first insights into the ambient seismic field in the Vienna Basin retrieved from this dataset. We perform beam-forming to detect noise sources outside of the study area, as well as Matched Field Processing to detect and locate noise sources at the surface inside of it. The wave-field is dominated by cultural noise. Inside the network, noise is mainly generated by cars on streets, trains on railways, activity in town centers, and also wind turbines. Outside the network, we map the city of Vienna as a major contributor to noise.

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Track Classification: Theme 1. The Earth as a Complex System