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3-component beamforming analysis of ambient seismic noise field for Love and Rayleigh wave source directions

Carina Juretzek and Céline Hadziioannou
Department of Earth and Environmental Sciences, Ludwig-Maximilians-Universität, Munich, Germany

Our knowledge about common and different origins of Love and Rayleigh waves observed in the microseism band of the ambient seismic noise field is still limited, including the understanding of source locations and source mechanisms. Multi-component array methods are suitable to address this issue. In this work we use a 3-component beamforming algorithm to obtain source directions and polarization states of the ambient seismic noise field within the primary and secondary microseism bands recorded at the Gräfenberg array in southern Germany. The method allows to distinguish between different polarized waves present in the seismic noise field and estimates Love and Rayleigh wave source directions and their seasonal variations using one year of array data. We find mainly coinciding directions for the strongest acting sources of both wave types at the primary microseism and different source directions at the secondary microseism.