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Ambient-noise tomography using the AlpArray seismic network – preliminary results

Emanuel Kästle (1), Irene Molinari (2), Lapo Boschi (3), and Eduard Kissling (4)

(1) Institut für geologische Wissenschaften, Freie Universität Berlin, Germany (emanuel.kaestle@fu-berlin.de), (2) National Institute of Geophysics and Volcanology, INGV, Bologna, Italy, (3) Dipartimento di Geoscienze, Universita' degli Studi di Padova, Italy, (4) Institut für Geophysik, ETH Zürich, Switzerland

The AlpArray seismic experiment provides an unique opportunity to study mountain-building processes in the European Alps. By further constraining the 3D geometries of foreland basins, of the complex Europe-Adria plate boundary and of other important structures such as the Ivrea body in the western Alps and the Alps-Apennines and Alps-Dinarides transitions we aim to improve our understanding of past and ongoing tectonic processes in the region. Ambient-noise tomography, when applied to the high-quality AlpArray datab provides high-resolution information throughout the crust and over the whole region thus enabling to link near-surface geologic information with deep crustal structures and mantle process

Using two years of data collected by the AlpArray seismic network, we are able to obtain more than 150,000 station-station cross-correlations from which we extract phase- and group-velocity measurements. Compared to previous studies (e.g. 25,000 measurements, Kästle et al., 2018), this is an order of magnitude increase in measurement density, giving us the opportunity to study the crustal shear-velocity structure in the entire Alpine arc with unprecedented resolution. We present first results of our work-in-progress, including the technical aspects of handling such a large dataset and first results of the phase-velocity maps, for both Love- and Rayleigh waves.