Characterization of ambient seismic noise and preliminary tomographic model of the shallow crust beneath the Mauléon basin from the large-N Maupasacq Experiment

Maximilien Lehujeur (1), Sébastien Chevrot (1), Laurent Stehly (2), jacques Brives (2), and Magali Collin (3)

(1) CNRS, Observatoire-Midi-Pyrénées, GET, Toulouse, France, (2) Université Grenoble Alpes, ISTerre, Grenoble, France, (3) Total, Pau, France

We study the data of the very dense Maupasacq seismic network, deployed from March to October 2017 in the western Pyrenees (France), to study the crust and upper mantle beneath the Mauléon basin. This study is part of the Orogen research project, a tripartite partnership between academy and industry (Total, BRGM, CNRS). The network includes about 450 3-component seismic sensors, including broad-band, short-period sensors and geophones. We characterize the energy, direction of propagation and polarization of the surface waves composing the ambient noise. Strong variations in polarization directions are observed within the network. Body waves with normal incidence are also evidenced, especially during the summer period, during which the oceanic noise sources are weaker. The beamforming analysis conducted on the continuous recordings provides us with a model of the noise source propagation direction and allows us to focus on the periods of time where the noise is most favorable for ambient noise imaging. We show that a wise selection of temporal windows is sufficient to estimate the inter-station Green's function with a good signal to noise ratio, from which a preliminary shear-wave velocity model of the area was obtained.