The SWATH-D seismological network in the Eastern Alps

Benjamin Heit*[1], Luigia Cristiano[1], Christian Haberland[1], Frederik Tilmann[1,2], Damiano Pesaresi[3], Yan Jia[4], Susanne Hemmleb[1], Martin Haxter[1], Thomas Zieke[1], Karl-Heinz Jaeckl[1], Antje Schloemer[5], Michael Weber[1,6]

1. GFZ German Research Centre for Geosciences, Potsdam, Germany
2. Freie Universität Berlin, Berlin, Germany
3. Istituto Nazionale di Oceanografia e di Geofisica Sperimentale–OGS, Sgonico (TS), Italy
4. ZAMG Zentralanstalt für Meteorologie und Geodynamik, Vienna, Austria
5. LMU Universität München, Geophysikalisches Observatorium, Fürstenfeldbruck, Germany
6. Universität Potsdam, Institut für Geowissenschaften Campus Golm, Potsdam, Germany

DOI: http://dx.doi.org/10.17169/refubium-41105

The SWATH-D experiment involved the deployment of a dense temporary broadband seismic network in the Eastern Alps. Its primary purpose was enhanced seismic imaging of the crust and crust-mantle transition as well as improved constraints on local event locations and focal mechanisms in a complex part of the Alpine orogen. The study region is a key area of the Alps, where European crust in the north is juxtaposed and partially interwoven with Adriatic crust in the south, and a significant jump in the Moho depth was observed by the 2001 TRANSALP N-S profile. Here, a flip in subduction polarity has been suggested to occur. This dense network encompasses 163 stations and complements the larger-scale sparser AlpArray seismic network. The nominal station spacing in SWATH-D is 15 km in a high alpine, yet densely populated and industrialized region. We present here the challenges resulting from operating a large broadband network under these conditions and summarize how we addressed them, including the way we planned, deployed, maintained and operated the stations in the field. Finally, we present some recommendations based on our experiences.