Geophysical Research Abstracts
Vol. 15, EGU2013-6436, 2013
EGU General Assembly 2013

First results of a new seismic profile across the southwestern Alps, CIFALPS

Liang Zhao (1), Anne Paul (2), Stefano Solarino (3), Coralie Aubert (2), Tianyu Zheng (1), Simone Salimbeni (3), Stéphane Guillot (2), Qingchen Wang (1), Yinshuang Ai (1), Pierre Zangelmi (2), Yumei He (1), Romain Lainé (2), Ling Chen (1), Weiwei Xu (1), Wei Lin (1), Lucia Margheriti (3), Silvia Pondrelli (3), and Rixiang Zhu (1)

(1) State Key Laboratory of Lithospheric Evolution, Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing, China (zhaoliang@mail.iggcas.ac.cn), (2) Institut des Sciences de la Terre (ISTerre), CNRS - Université Joseph Fourier, Grenoble, France, (3) Istituto Nazionale di Geofisica e Vulcanologia, Italy

Though the Alps is the most studied mountain belt by geologists, a number of questions on its dynamics remain open due to the lack of detailed data on its lithospheric and sublithospheric structure. This is particular true for the very arcuate southwestern part of the belt. In order to improve images of the crust and upper mantle beneath the southwestern Alps, we (IGGCAS, ISTerre and INGV) have installed a temporary broadband seismic array across the belt from the Rhone valley (France) to the Po plain (Italy). The main sub-array of the CIFALPS (China-Italy-France Alps seismic survey) project is a 350-km long roughly linear profile of 46 stations trending WSW-ENE from Bollène (France) to north of Alessandria (Italy). Its average station spacing is smaller than 10 km, with a densification to 5 km in the internal Alps. Nine additional temporary stations located $\sim$40 km to the north and south of the main profile complement the permanent broadband networks to improve the 3-D constraints on the deep structures. Stations are equipped with Nanometrics Taurus data acquisition systems, and Trillium 120P/A, CMG3-ESP or CMG40T broadband sensors. The array was installed in the summer of 2012 and will be operated at least to April 2013. Quality-control analysis of the 4 to 5 months of data recorded till December 2012 shows that data quality is good, especially on the vertical component. We used this first part of the dataset to compute receiver functions, estimate shear-wave splitting from SKS phases and Rayleigh wave velocity dispersion from ambient noise correlations. A preliminary common-conversion point migrated receiver function section displays a strong Moho P-to-S conversion beneath the western end of the profile, which weakens gradually from west to east. The European Moho can hardly be traced beneath the internal Alps. As expected, the complex crustal structure of the internal zones leads to intricate converted phases. We confirm that the major fast polarization directions are NW-SE, supporting the interpretation of a belt-parallel mantle flow.