Geophysical Research Abstracts
Vol. 15, EGU2013-9072, 2013
EGU General Assembly 2013

Strategy for the deployment of a dense broadband temporary array in the Alps: lessons learnt from the CIFALPS experiment

Aubert Coralie (1), Paul Anne (1), Solarino Stefano (2), Roussel Sandrine (1), Salimbeni Simone (2), Zangelmi Pierre (1), Cougoulat Glenn (1), Ai Yinshuang (3), Xu Weiwei (3), He Yumei (3), and Zhao Liang (3)

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

The CIFALPS (China-Italy-France Alps seismic survey) experiment is a common project of IGGCAS (China), ISTerre (France) and INGV (Italy). It aims at getting new high-resolution passive seismic data on the crustal and upper mantle structure of the southwestern Alps. In this framework, we have installed a temporary broadband seismic array across the southwestern Alps from the Rhône valley (France) to the Po plain (Italy). The main sub-array of CIFALPS is a 350-km long roughly linear profile of 46 stations trending WSW-ENE from Bollène (France) to north of Alessandria (Italy). The average station spacing is 10 km in the outer parts of the belt, and it reduces 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. Because our schedule was tight, we had to achieve site selections in only 3-4 months in spite of strong constraints on site location related to short interstation spacing. Most sites are located in basements of buildings for security reasons and mains power supply. As most sensors are true broadband (90s or 120s), we put much effort on vault design to insure good thermal insulation and low noise at long periods. The vaults also had to be easily and rapidly built and they should be easily and totally removed at the end of the experiment. We used the PQLX software for quality control of our sites and vault design. The performances of our vaults are good for the vertical component with noise levels at 100s period in the range -185 dB (low noise model) to -165 dB. They are less good for horizontal components (noise level close to high noise model at periods > 20s) due to atmospheric pressure and temperature variations. Stations located outside buildings do not have better performances at 100s than stations located in basements. Two of our six stations installed outside buildings are prone to mass centering problems due to tilting of the concrete slab in soft soil. For state-of-health control and data transmission, we are testing 2G and 3G communication modems at 4 remote stations but with limited success. Database preparation and management benefitted from the expertise of engineers of the seismic datacenter of ISTerre. The experience gained on all technical aspects of a temporary experiment will provide valuable input for the preparation of the future AlpArray project.