Geophysical Research Abstracts
Vol. 12, EGU2010-4530, 2010
EGU General Assembly 2010

Usability of Seismic Noise Cross-Correlations for Local-Scale Networks

T. Megies, H. Igel, and J. Wassermann
Department of Earth and Environmental Sciences, LMU, Munich, Germany

The cross-correlation technique to reconstruct Green's functions from ambient seismic noise is tested for its usability with short-period data of the local-scale network at Mt. Hochstaufen, SE Germany. Processing schemes mainly developed for low-frequency data are adapted to the short-period data.

The reconstructed Green's functions are stacked on different time scales and the usability for different applications is tested:

Daily Green's function stacks are used for quality control in order to detect and correct for errors in the time-stamping of the recorded data. These errors include drifting digitizer clocks due to loss of GPS reception (up to 10^{-1} seconds per day) as well as sudden one-second offsets in GPS timing. Monthly stacks are used for interferometric analysis in order to assess small relative variations of the seismic wave velocity of about $\pm$ 0.7 %. Observed precipitation rates and earthquake swarm activity are found to correlate well with the estimated velocity variations.

Finally, stacking all available data for every pair of stations, preliminary observations on the usability for local surface wave tomography are made. The results indicate that the modal content of the high-frequency anthropogenic part of the noise field is more complex than with the low-frequency natural part, and the supposedly strongly fractured and karstified source region of the earthquake swarms affects the propagation of coherent surface wave trains at certain frequencies.