Geophysical Research Abstracts
Vol. 18, EGU2016-7753, 2016
EGU General Assembly 2016

Comparison of Direct and Array-Derived Strain and Rotation at the Pinon Flat Observatory, California

Chin-Jen Lin (1), Frank Vernon (2), Joachim Wassermann (1), André Gebauer (1), Ulrich Schreiber (3), Duncan Carr Agnew (2), and Heiner Igel (1)

(1) Department of Earth and Environmental Sciences, Ludwig-Maximilians-University Munich, Germany(lin@geophysik.uni-muenchen.de), (2) Institute of Geophysics and Planetary Physics, SCRIPPS Institution of Oceanography, La Jolla, CA, (3) Forschungseinrichtung Satellitengeodäsie, Technical University Munich, Fundamentalstation Wettzell, Sackenriederstrasse 25, D-93444 Kötzting, Germany

To fully understand the wave motion of a deformable body, we need 12 components in total: 3 components of translation, 3 components of rotation, and 6 components of strain. Translation are routinely recorded in the seismology community. Strain measurements are rare and do not routinely enter the inversion procedures for structure and source from seismic observations. Single-component rotational ground motions have been measured just recently. In principle, strains and rotations can be derived from an array of seismic stations, under uniform strain assumption across the array. In a unique instrument setting at the PFO (Pinon Flat Observatory, California), a dense small-aperture seismic array is in the vicinity of a sensor measuring rotations around a vertical axis (ring laser) and three horizontal strain meters. This enables us to compare array derived strain/rotation with observations for 10/12 components of complete ground motion. We show the comparison results between array-derived ground motion and direct observation for tele-seismic events. Several possible errors like tilt couplings, array size, seismometer noise are discussed.