S012-0006 - Performance Testing of Rotation Sensors in Seismology With an Active Source Experiment

Tuesday, 8 December 2020

13:00 - 05:59

Live Chat with Presenter Ended 8 December 12:00

View Poster

Abstract

Observing the rotational components of a seismic wavefield in addition to translational components has increased over the last few decades. This new kind of measurement will improve all disciplines of seismology as well as related fields of research. Direct observation of S-wave components, estimation of Love-wave phase velocities and the usage of a six-component measurement as replacement for an array measurement are only a few examples of application. As this field of observation is still new, available sensors are hardly explored regarding their full performance in the wide frequency and sensitivity range of seismic signals. However, a detailed sensor performance characterization is crucial for reliable seismic observations. Therefore, an experiment with more than 20 different rotational motion sensors was conducted in November 2019 in Fürstenfeldbruck, Germany. The instruments were running over several days in different settings: First, a huddle test was performed in particular to derive the self-noise of the sensors by several methods. With a common input signal from an artificial explosion during the huddle test the timing accuracy of the sensors can be studied. Following this test the sensors were distributed over a larger area and a Vibroseis truck as well as artificial explosions were used to generate input signals. Records from these signals are used to retrieve information on the sensor sensitivity and signal similarity by means of cross-correlation and coherency spectra. The results of the experiment will further be used to establish a high-quality standard in measuring seismic ground rotation.

Authors

Kathrin Behnen

Ludwig Maximilians University of Munich

Felix Bernauer
LMU Munich

Joachim M Wassermann
Section Geophysics

Heiner Igel
Ludwig Maximilians University of Munich

Stefanie Donner
BGR Federal Institute for Geosciences and Natural Resources

Seismology ›