Rotation and Strain Instrument Performance Tests with Active Seismic Sources

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Interest in measuring seismic rotation and strain is growing in many areas of geophysical research. This results in a great need for reliable and field deployable instruments measuring ground rotation and strain. To further establish a high quality standard for rotation and strain measurements in seismology, researchers from the Ludwig-Maximilians University of Munich (LMU), the German Federal Institute for Geosciences and Natural Resources, the University of Potsdam and the ETH Zürich organized a comparative sensor test experiment which took place in November 2019 at the Geophysical Observatory of the LMU in Fürstenfeldbruck, Germany. More than 40 different sensors such as ring-laser and fiber optic gyroscopes, a Distributed Acoustic Sensing (DAS) cable and interrogator, liquid-based as well as mechanical rotation sensors were involved in addition to 12 classical broadband seismometers and a 80 channel, 4Hz geophone chain. The experiment consisted of two parts: during the first part, the sensors were co-located in a huddle test recording self noise and signals from small, nearby explosions. In a second part, the sensors were distributed into the field in various array configurations recording active seismic signals generated by small amounts of explosive and a vibro-seis truck. This contribution presents details on the setup of the experiment and first results on sensor performance characteristics and signal similarities.