

EGU2020-4256

<https://doi.org/10.5194/egusphere-egu2020-4256>

EGU General Assembly 2020

© Author(s) 2020. This work is distributed under the Creative Commons Attribution 4.0 License.



Rotation and Strain Instrument Performance Tests with Active Seismic Sources

Felix Bernauer¹, Joachim Wassermann¹, Katrin Behnen¹, Heiner Igel¹, Stefanie Donner², Pascal Edme³, David Sollberger³, Patrick Paitz³, Jonas Igel³, Gizem Izgi⁴, Eva P.S. Eibl⁴, Stefan Buske⁵, Christian Veress⁶, Frederic Guattari⁷, Olivier Sebe⁸, Basil Brunner⁹, Anna T. Kurzych¹⁰, Piotr Bonkovsky¹¹, Piotr Bobra¹¹, Johana Brokesova¹², and the Fürstenfeldbruck Experiment Team*

¹Ludwig Maximilians Universität München, Department of Earth and Environmental Sciences, Fürstenfeldbruck, Germany (fbernauer@geophysik.uni-muenchen.de)

²Federal Institute for Geosciences and Natural Resources, Stilleweg 2, 30655 Hannover, Germany

³Department of Earth Sciences, ETH Zürich, Sonneggstrasse 5, 8092 Zürich, Switzerland

⁴Institute of Geosciences, University of Potsdam, Karl-Liebknecht-Str. 24-25, 14476 Potsdam-Golm, Germany

⁵Institute of Geophysics and Geoinformatics, TU Bergakademie Freiberg, Gustav-Zeuner-Strasse 12, 09599 Freiberg, Germany

⁶Bayerisches Landesamt für Umwelt, Hans-Högn-Straße 12, 95030 Hof/Saale, Germany

⁷ixblue, 34 Rue de la Croix de Fer, 78100 Saint-Germain-en-Laye, France

⁸Commissariat Energie Atomique, Direction des Applications Militaires, Direction Ile de France, 91297 Arpajon, France

⁹Streckeisen GmbH, Daettlikonerstrasse 5, 8422 Pfungen, Switzerland

¹⁰Institute of Applied Physics, Military University of Technology, 2 gen. S. Kaliskiego Str., 00-908 Warsaw, Poland

¹¹Faculty of Civil Engineering and Architecture, Opole University of Technology, 45-951 Opole ul. Katowicka 48, Poland

¹²Department of Geophysics, Charles University, V Holesovickach 2, 180 00 Prague, Czech Republic

*A full list of authors appears at the end of the abstract

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.

Fürstenfeldbruck Experiment Team: Bernauer, F. , J. Wassermann, K. Behnen, S. Egdorf, H. Igel, S. Donner, K. Stammeler, M. Hoffmann, P. Edme, D. Sollberger, Y. Rossi, C. Schmelzbach, P. Paitz, J. Igel, K. Smolinski, A. Fichtner, G. Izgi, D. Vollmer, E.P.S. Eibl, S. Buske, C. Veress, F. Guattari, T. Laudat, L. Mattio, O. Sebe, S. Olivier, C. Lallemand, B. Brunner, A.T. Kurzych, M. Dudek, Z. Krajewski, L.R. Jaroszewicz, J.K. Kowalski, P. Bońkowski, P. Bobra, Z. Zembaty, J. Vackář , T. Kratochvíl, and J. Brokesova