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Demonstration of the capabilities of Distributed Acoustic Sensing technology

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Distributed Acoustic Sensing (DAS) is an emerging technology in wide range of seismic applications. It has been already widely used in fundamental and applied seismology [1] providing beyond comparison spatial resolution of the seismic wavefield with high density. The demonstrated T8 DAS product detects seismic waves by measuring successive phase changing of Rayleigh backscattering light of the interrogating pulses, converting it to the strain rate recordings in the uppermost layer [2, 3]. Currently a lot of work is being carried out using DAS technology in different areas including comparison of DAS channel signals with conventional seismic sensors.

We demonstrate a simple showcase of how DAS works. We demonstrate DAS functionality jointly with traditional seismic sensor comparing tap tests records with corresponding 2D space-time amplitude “waterfall“ displays.

References.

[1] Y. Li, M. Karrenbach, J.B. Ajo-Franklin, eds., Distributed acoustic sensing in geophysics : methods and applications, Hoboken, UDA.: John Wiley & Sons, 2021.

[2] M.C. Fenta, D.K. Potter and J. Szanyi, Surv Geophys. 42 (2021) 551.

[3] S.P. Nikitin, K.V. Kislov, Y.O. Starovoit, D.M. Bengalskii, E.P. Spiridonov, D.R. Kharasov, E.A. Fomiryakov, O.E. Nanii and V.N. Treshchikov, Instrum Exp Tech.. 66 (2023) 854