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First results of the 2025 active seismic campaign at the EMR-site

Taking the experience from the 2022 drilling and seismic acquisition campaign on board the subsurface team of the EMR-regions devised a second data acquisition program that was executed from Q2 2024 to Q1 2025. The purpose of the campaign was to enable the construction of a 3D integrated subsurface model in support of civil engineering, and hydrogeological as well as seismic noise modelling.

As part of the drilling campaign four wells at potential corner points of the ET-triangle were newly instrumented with optical fiber for digital strain, temperature, and acoustic sensing (DAS). During the active campaign the DAS-fiber were used to acquire vertical-seismic-profiles (VSP's), simultaneously with the acquisition of 2D seismic lines that connect prospective corner-points. In total some 95km of 2D data and 5 VSP's were acquired.

The very first processing results of the 2D surface lines and VSP's are just becoming available and show an improved near surface image. This can be attributed to some optimized acquisition parameters, while keeping the cost in mind.

The 2D surface seismic was acquired with a 4m source and receiver spacing, which allowed just an adequate sampling of the seismic wavefield. In contrast to conventional acquisition design not a group of vibrators but only one single vibrator was used. This avoided the interference noise that occurs when using multiple vibrators at the same time and likely contributes to the improved near surface image. To reduce the environmental impact and being allowed to enter ecologically sensitive areas an electrical vibrator was employed. It operated reliably between 2-120Hz at 7000N. As geophones 1-component nodes with a frequency range of 1-125Hz were deployed, to at least a maximum offset of 1200m.

For the VSP's the vertical sampling was set at 8m being a compromise between obtaining a sufficient signal-to-noise ratio and an acceptable vertical resolution. The source spacing was again 4m. The goal of the VSP's is, besides enabling the time-to-depth conversion of the surface seismic, to provide detailed 1D velocity and attenuation profiles, which will be useful for realistic seismic noise modelling.

Primary authors: JARON, Alexander (RWTH); VINK, Bjorn (Nikhef); NGUYEN, Frédérique (ULiège); MICHEL, Hadrien (ULiège); LAHAIJE, Hugo (Nikhef); KERSTJENS, John (Nikhef); WALDVOGEL, Marius (RWTH); KIEHN, Michael (Nikhef); VERHOOREN, Puck (TNO); SHANI-KADMIEL, Shahar (KNMI); KOLEY, Soumen (ULiège); VAN DE WEIJER, Vincent (TNO); WALK, Wim (Nikhef); CAMPMAN, Xander (Shell); VANBRABANT, Yves (Geological Survey of Belgium)

Presenter: KIEHN, Michael (Nikhef)

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