

WHO WE ARE

The Helmholtz Innovation Lab is located at the German Research Centre for Geosciences in Potsdam.

The centre covers a comprehensive spectrum of expertise in geoscience and engineering. It is complimented by long-term operation of expansive instrument networks, arrays and observatories, as well as data and analytical infrastructures, innovation and deep methodological and technological knowhow.

The 3D-US Lab supports companies on projects for exploration ahead and around underground structures, consulting and developing individual customer solutions.

We use a modular measurement methodology of underground seismics to generate 3D-images of underground structures. In addition to cooperating closely with the industry, our Lab also collaborates with mining agencies and universities.

Cooperation opportunities

- Contract research
- Project research
- Licensing
- Network partnerships



3D UNDERGROUND SEISMIC LAB



OUR EXPERTISE

- More than 20 years of experience in the development of seismic measurement methods
- Our strengths are seismic borehole survey, tunnel- and underground 3D exploration, for instance of underground storage locations
- Improvement of seismic imaging methods and development of seismic acquisition components taking into account the requirements of mining, tunnelling and drilling
- Experience in wide range of rock types, especially in crystalline, salt and clay rocks
- 3D Underground seismic software for combined borehole and drift data processing and imaging
- Parallelized pre-stack depth migrations in 3D-space to calculate cubic volumes of billions of image points
- Operation of own GFZ-Underground Lab in the Reiche Zeche mine in Freiberg as a scientific work place, which is available for joint validation tests under practical conditions

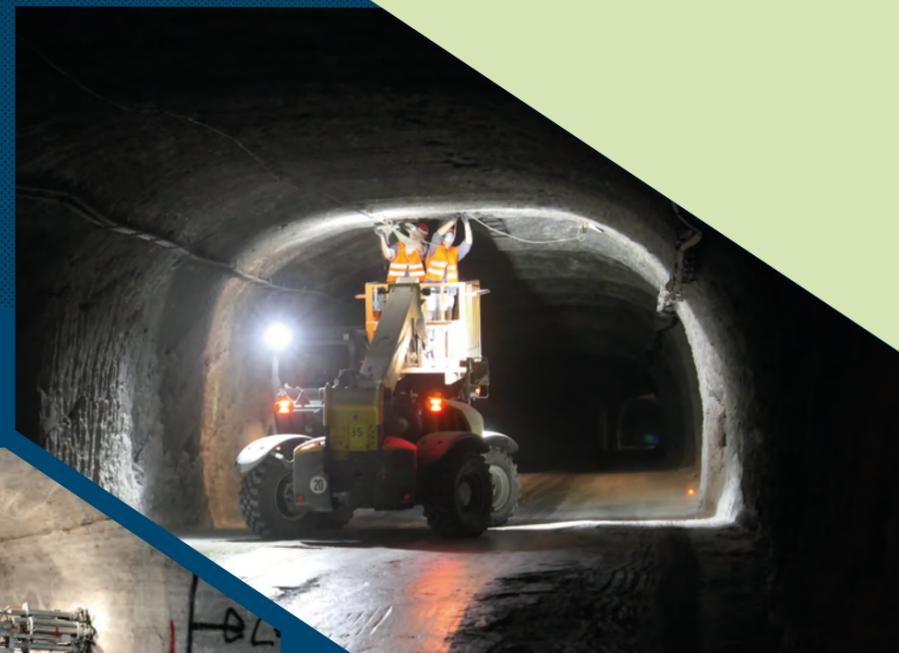


www.3duslab.com
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We develop innovative solutions for your successful underground exploration

We serve as an unique platform for innovative research in underground seismics with industry collaboration

Our goal is to advance existing approaches in applied technology development

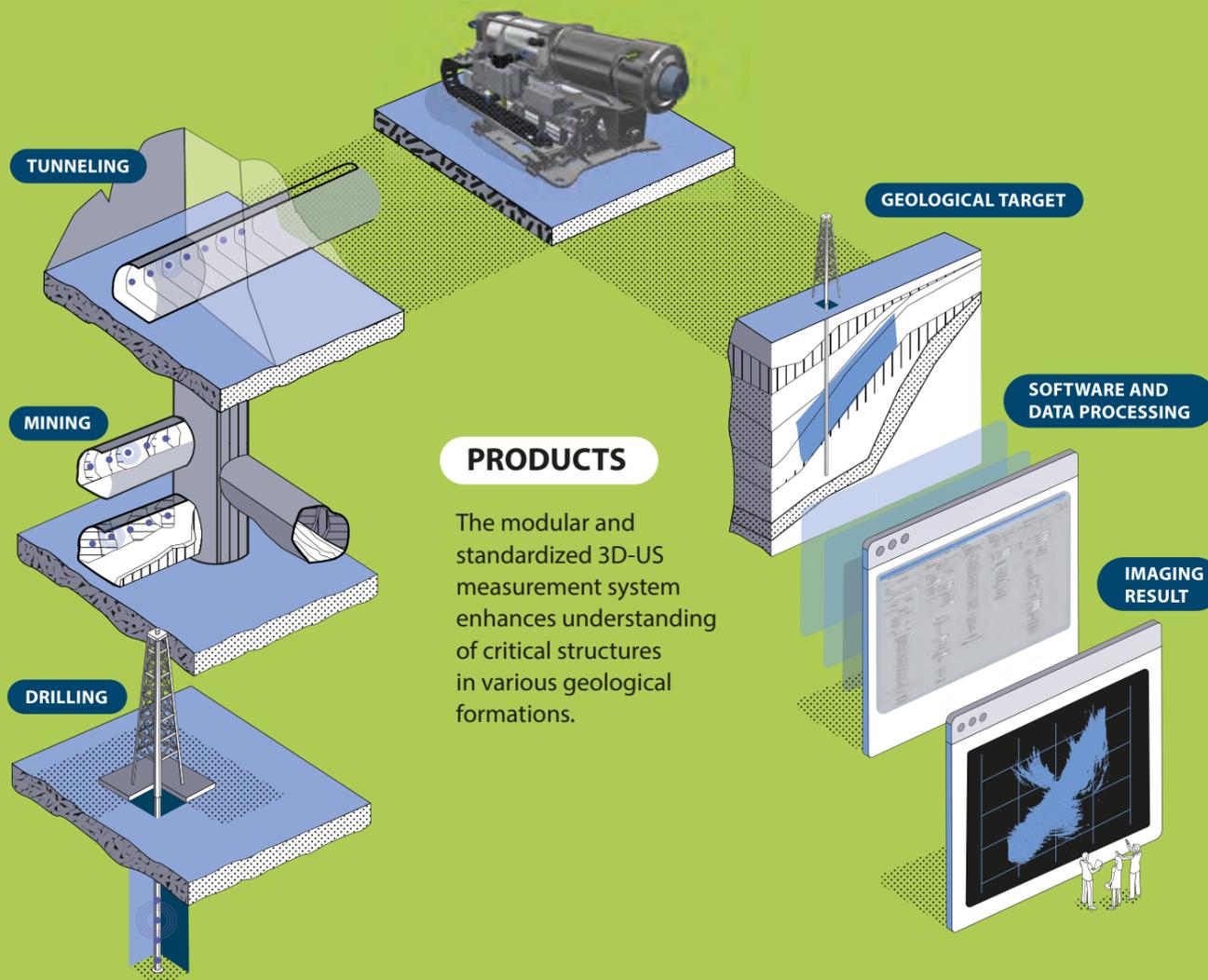


As part of the German Research Centre for Geosciences - our knowledge is based on the expertise of a broad scientific network

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UNDERGROUND SEISMIC EXPLORATION

Our measuring and imaging system



PRODUCTS

The modular and standardized 3D-US measurement system enhances understanding of critical structures in various geological formations.

FIELDS OF APPLICATION

Our measurement system enables precise 3D seismic exploration by leveraging spatially accessible underground structures. It has diverse applications, including 3D seismic exploration of subsurface areas and boreholes, as well as seismic pre-exploration for tunnels.

IMAGING

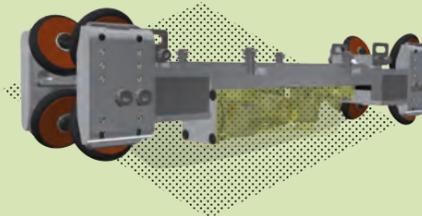
Based on results of our modular measurement system we generate 3D images of underground structures.

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DISCOVER THE WORLD OF 3D-US LAB



PRODUCTS



Vibration source

- ◆ Combined 4 actuators
- ◆ Exploration depth: 100 – 450 m
- ◆ Frequency range: 100 – 6000 Hz
- ◆ Weight: 120 kg



Impact hammer

- ◆ Pneumatically driven
- ◆ Exploration depth: 100 – 250 m
- ◆ Repetition sequence: 5 s
- ◆ Weight: 60 kg

Borehole receiver tool

- ◆ Receiver chain, up to 8 levels (variable spacing)
- ◆ 3-component geophone receivers
- ◆ Placement depth: 200 m in horizontal wells
- ◆ Borehole diameters: 78 – 96 mm

SERVICES

Use of seismic measuring instruments for signal generation and registration

3D underground seismic campaigns to investigate hazardous areas
3D-Seismic Imaging results

Modularization and standardization of developed methods to improve the adaptation to specific technical and logistical conditions

Innovative software solutions for data processing and imaging

Development of individual customer-specific solutions and tools for investigations in various geological environments

Performance tests in our GFZ Underground Laboratory

