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## March 2021

### Novel wireless trigger unit WRU1 available

We have developed a novel wireless trigger unit (WTU1) which is used to replace trigger cables if e.g. roads or rivers prevent a continuous seismic measurement. This wireless trigger unit WTU1 works with nearly all impulse sources including sledge hammers and have an antenna range of 18 metres.

The trigger unit WTU1 consists of two boxes which include the sender and the receiver unit. The sender will be connected to the source and the receiver to the seismograph. Both the sender and receiver units are placed in small and robust plastic cases which allow an easy operation and uses a power supply of 9V.



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## September 2020

### Determination of the damping ratio by multi-channel spectral analysis of seismic downhole data

Soil dynamic parameters such as the damping ratio are of major interest in earthquake engineering. We've currently published a publication which comes back to a relationship between attenuation and velocity dispersion of body waves which replaces the measurement of the amplitude characteristics of seismic signals by a frequency dependent velocity function. The implementation of this method has previously shown to be difficult because of the very small levels of dispersion observed in seismic data. Our approach aims to overcome the problem by applying a multi-channel spectral analysis which is widely used in surface wave testing to calculate a velocity dispersion. The velocity dispersion curve is extracted from a phase velocity–frequency spectrum and the damping ratio is calculated by fitting a theoretical dispersion curve to the extracted curve. The method is demonstrated on correlated data of a seismic downhole test performed using an S-wave vibrator source.

You can find the paper below following link: <https://doi.org/10.1002/nsg.12010>

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2020

## **Geotomographie received "Innovative Through Research" award 2020/2021**

The seal "Innovation through Research" has been awarded to Geotomographie by the Stifterverband/Germany. The Stifterverband honors researching organizations for their special communal and societal responsibility with the quality seal. The Stifterverband focuses its efforts primarily on the fields of education, science and innovation. To date, it is the only organisation in Germany to engage in holistic work in all three areas, with projects that build on one another with synergistic effect.

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## **New design of BHC5**

The new design of the BHC5 contains an additional internal test function to allow a quality check. The new hydrophone string BHC5 replaces the older unit BHC4.

The new BHC5 amplifier boards are now equipped with an additional internal test function. The test function outputs a synthetic signal on each channel where the amplification factors can be evaluated. This allows a quality check of the hydrophones at any time.

## **Next generation of Elvis VII replaces the older Elvis III unit**

The new version of the vibrator source Elvis is now on the market. The Elvis VII provides a higher peak force of 1100 N and frequencies between 20-240 Hz for both, P- and S-waves. An investigation depth of up to 300 m (and more) for P-waves and up to 200 m (and more) for S-waves can now be reached depending on the geology.

**Elvis VII | Surface Vibrator Source:** The vibrator source Elvis VII is used to generate P- or S-wave sweep signals. An adjustable pneumatic suspension ensures a maximum release of seismic energy under different surface conditions. To allow the movement of the source along the seismic line a wheelbarrow is used. Please take detailed technical information from the product sheet.

## **Borehole Geophone String for S-Wave Tomography**

Alternatively to the digital MBAS-D system the analog version of a borehole geophone string (MBAS-A) is available on the market.

**MBAS-A | Analogue Multistation Borehole Acquisition System:** The instrument can be used for S-wave borehole tomography or downhole surveying. It consists of up to eight geophone stations each equipped with a tri-axial sensor. The string is fully water proof and can be used to receive P- and S-waves in dry or water filled boreholes. Please take detailed technical information from the product sheet.

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## Seismic Equipment for P-Wave Tomography up to 1000 m

We developed a prototype of a new P-wave sparker borehole source and digital hydrophone string.

**SBS1000 Magnum | P-Wave Sparker Borehole Source:** The borehole source SBS1000 Magnum is designed for P-wave tomography between boreholes up to 1000 m depth. The source consists of three parts housing the complete high-voltage power supply for charging up to about 3 KV. The source can be connected to a GO-4 cable head and a standard logging unit (4-conductor cable). The unit is powered from surface by means of a 230 VAC power supply.

**BHC1000 | Digital Hydrophone String:** The hydrophone string BHC1000 is a fully digitized borehole receiver unit running on 4-conductor cable. The system consists of max. 24 hydrophones moulded to a multicore cable. A digitization unit is placed on top of the string and can be connected to the standard 4-conductor cable. At surface a control unit is connected to the logging winch and directly to laptop.