TROMINO®

THE REACTIVE TROMOGRAPH

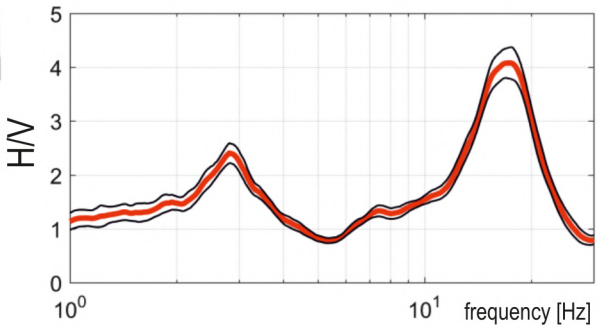
The first all-in-one instrument for the dynamic characterization of soils, structures and more...

Minimum size and power consumption
Maximum versatility

TROMINO® *is the first brick for any wall*

- 3 velocimetric channels with adjustable dynamic range and sensitivity: from microtremors (up to ±0.5 mm/s) to strong vibrations (up to ± 5 cm/s)
- 3 accelerometric channels (±2 g)
- 1 analog channel (e.g., external trigger for MASW and refraction)
- operating range [0.1, 1024] Hz on all channels with A/D conversion at 24 real bits
- GPS receiver with internal and/or external antenna for positioning and absolute timing/synchronization among different units
- built-in radio module for synchronization among different units and alarm transmission (e.g., signal above threshold)

- **Unique feature! Radio triggering tool for MASW and refraction surveys with a single-station, cableless system!**

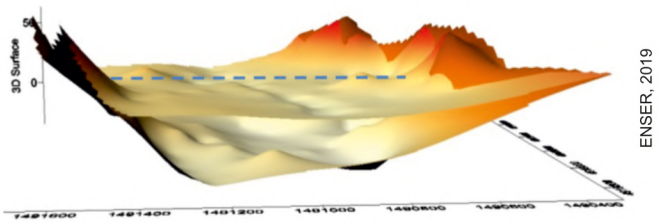


TROMINO® can be fully managed also by mobile devices. Real-time data visualization and processing with the Android TROMINO® App !

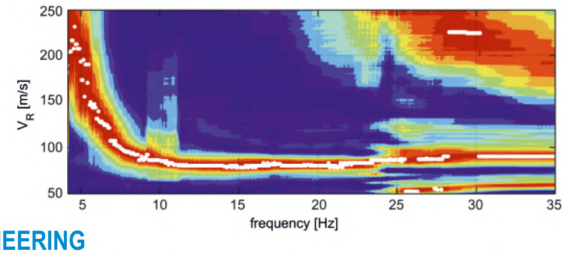
TROMINO® has a variety of applications in **engineering geology** and **seismic engineering**, both in single station and network configuration. A few examples:

GEOLOGY

- seismic site effect assessment, microzonation (HVSR, H&V)
- passive seismic stratigraphy

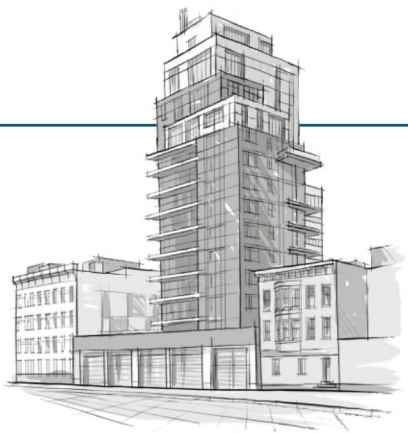


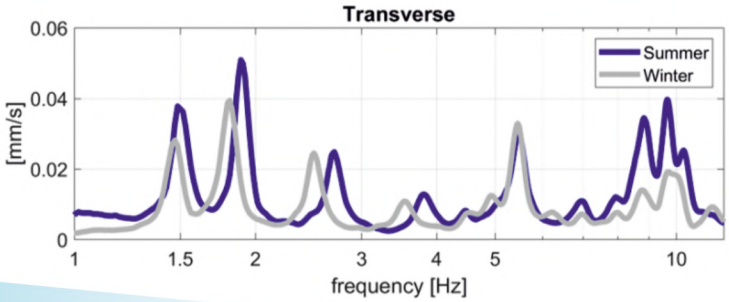
- Vs30/VsH estimation from constrained H/V curve fit
- active and passive seismic arrays (MASW, ReMi™, ESAC, FTAN), P and S wave refraction (requires radio\GPS synchronization or the wireless trigger)



ENGINEERING

- modal analysis of structures (single station or synchronized multi-station approach)
- vibration monitoring





www.moho.world

TROMINO® is an ultra-portable package:

- no external cables
- very small size (10 x 14 x 8 cm)
- very light weight (~1 kg)

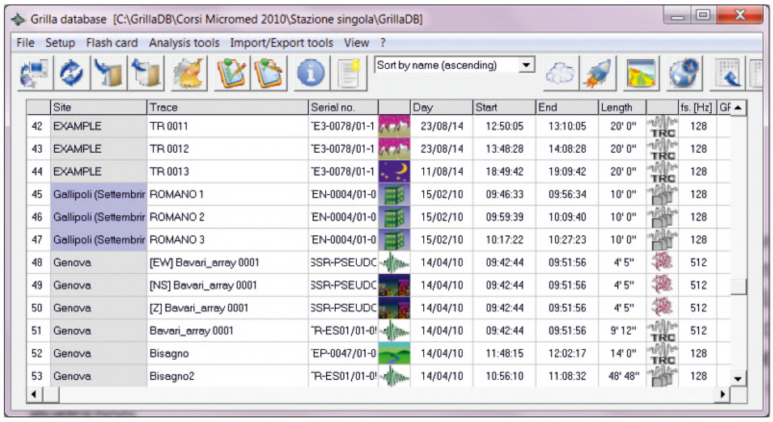
with very low consumption:

- powered by an internal Li-ion battery
- works also on AC adapter for long monitoring

TROMINO® can record in continuous mode or for predefined time intervals. It can work in stand-alone mode or in network configurations.

With the TROMINO® App, the dispersion and H/V curves appear on your mobile device as long as they are being collected in the field.

The TROMINO® App also allows to view the data in the time-domain during the acquisition, to share them with colleagues and provides a number of other advantages.



GRILLA, included with TROMINO®, is the powerful software to archive, manage and analyze the recordings.

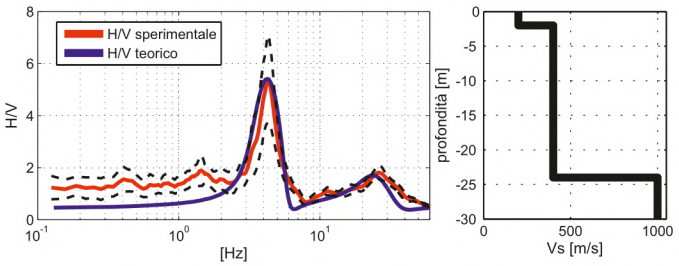
The main modules of GRILLA are:

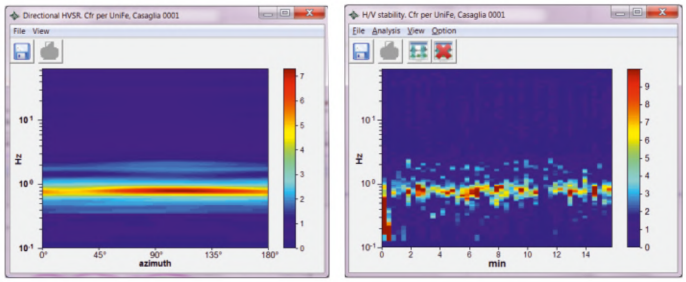
EXTENDED H/V ANALYSIS. Full spectral analysis, H/V curves to estimate soil resonances, **constrained H/V fit to get Vs profiles**, trace cleaning in the time- and frequency-domains, statistical testing of significance of the results based on the European guidelines, `reference site' method, comparison among different analyses and recordings. Automatic editable reports including tables and figures.

MODAL ANALYSIS OF STRUCTURES. Module to derive the modal frequencies shapes and damping of structures from experimental data.

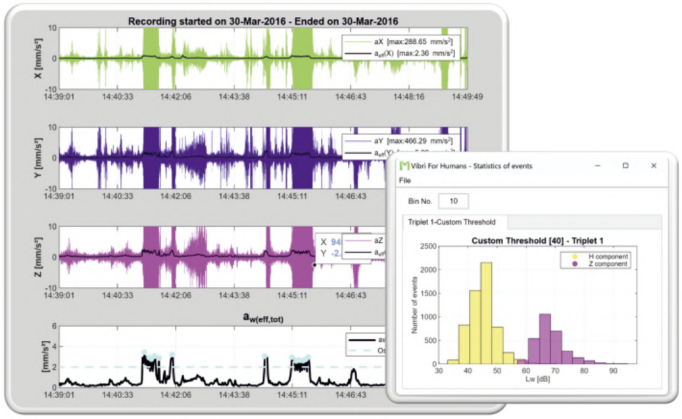
CONSTRAINED H/V CURVE FITTING FOR Vs30 ESTIMATES. H/V forward modeling and inversion tool based on surface waves (Rayleigh and Love). A constraint is needed to determine the model.

JOINT FIT OF H/V AND DISPERSION CURVES. Subsoil velocity profile from joint fitting of H/V, active (MASW, etc.) and passive (ReMi™, ESAC, SPAC, passive MASW, etc.) array surveys.

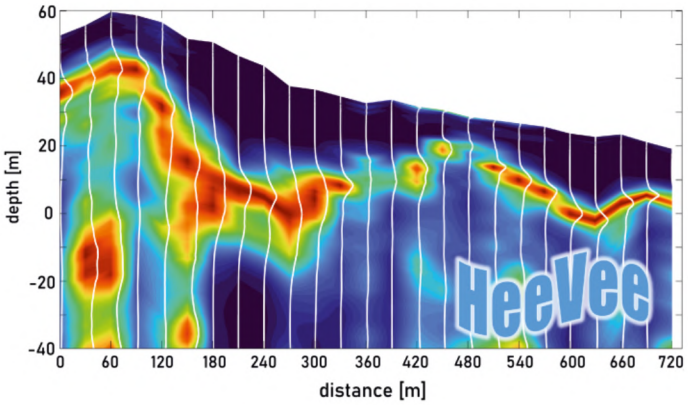




VIBRATION ANALYSIS AND MONITORING. Vibration recording and monitoring to detect tremors nuisant to people or potentially damaging for structures. Combine *Vibri* software for professional off-line or in real-time data analysis according to the main national regulations present in the world. Automatic editable reports including tables and figures.



H/V + H&V CONTOURING TOOLS. Process microtremor spectra (H&V) or spectral ratios (H/V) providing synthetic and understandable images of the main seismic reflectors in the subsoil. Combine **HeeVee** software to get the maximum results.



SCIENCE & TECHNOLOGY

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ICM CERTIFIED MANAGEMENT SYSTEM ISO 9001:2015

QUALITY SYSTEM CERTIFIED
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