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!**
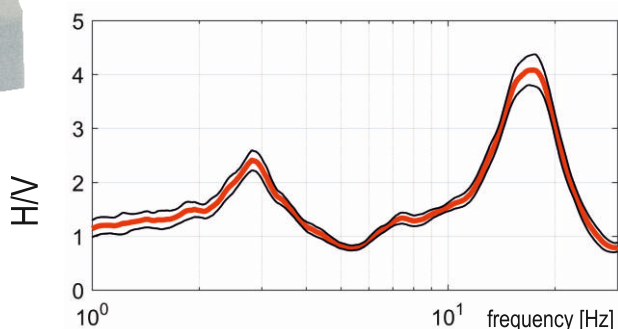
The new **TROMINO® BLU**, with an increased sensitivity, can be controlled also by mobile devices. Download the app!
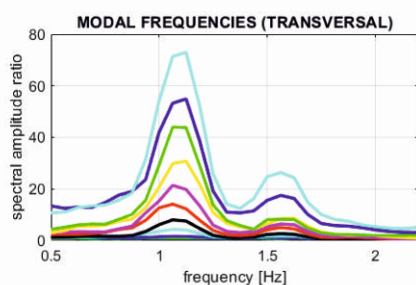

TROMINO® has a variety of applications in **engineering geology** and **seismic engineering**, both in single station and network configuration. A few examples:

GEOLOGY
- seismic site effect assessment and seismic microzonation
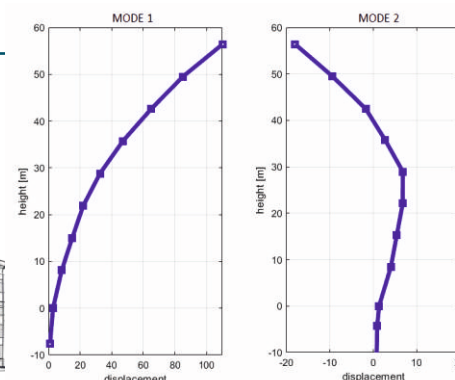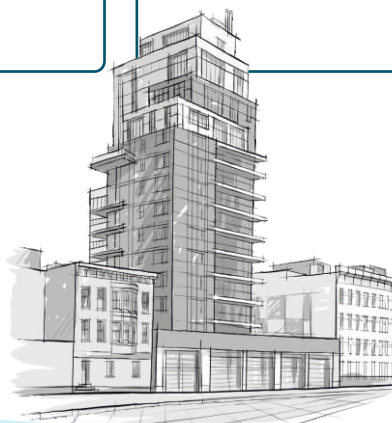- passive seismic stratigraphy

ENSER, 2019
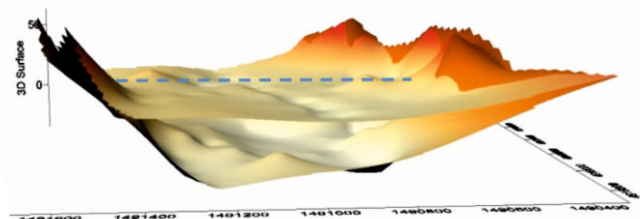
- Vs30/VsH estimation from constrained H/V curve fit
- active and passive seismic arrays (MASW, ReMi™, ESAC, FTAN), P and S wave refraction (requires radio\GPS synchronization or the wireless trigger)
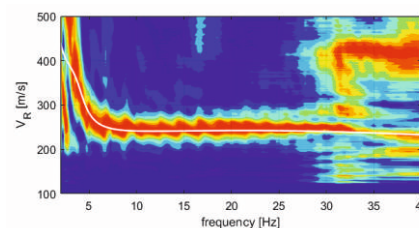
ENGINEERING
- modal analysis of structures (single station or synchronized multi-station approach)
- vibration monitoring

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 now be fully controlled (also vocally) by mobile devices, through the Tromino® App.

TROMINO® can record in continuous mode or for predefined time intervals. Starting is manual or on threshold. It can work in stand-alone mode or in network configurations through the software tool *Tromino Manager*. This allows to continuously view and save data acquired on remote stations and to send threshold-based alarms on-line or via e-mail. *Tromino Manager* controls networks of **TROMINOs®** connected via radio to a master **TROMINO®**.

**GRILLA** is the user-friendly software to archive and analyze the recordings of **TROMINO®**.

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.

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.
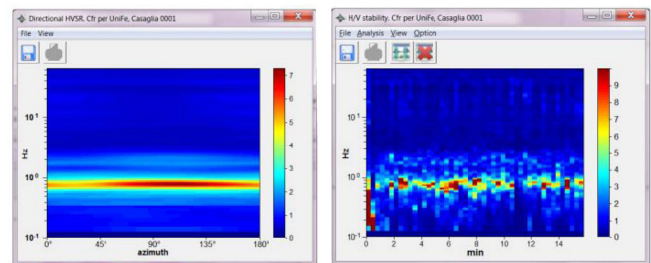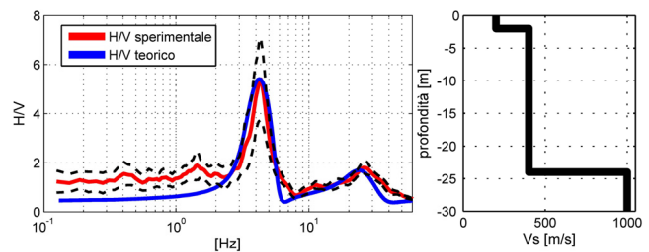
VIBRATION ANALYSIS. Sorting and spectral analysis of signal sections above thresholds, according to the European regulations on strong vibrations in structures. Automatic editable reports including tables and figures.
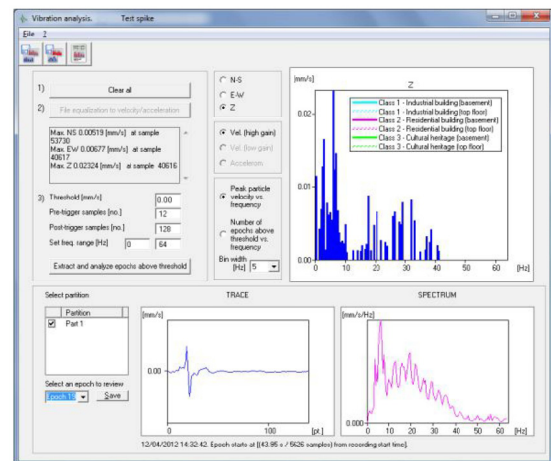
H/V+ CONTOURING MODULE. To provide a synthetic and understandable view of H/V recordings acquired in 2D or 3D configurations. Useful to map the continuity of the main seismic reflectors (the shift from the frequency to the depth domain requires additional constraints).