



GN309 High-resolution Intelligent Nodal Seismograph



Surface Wave Detection Method

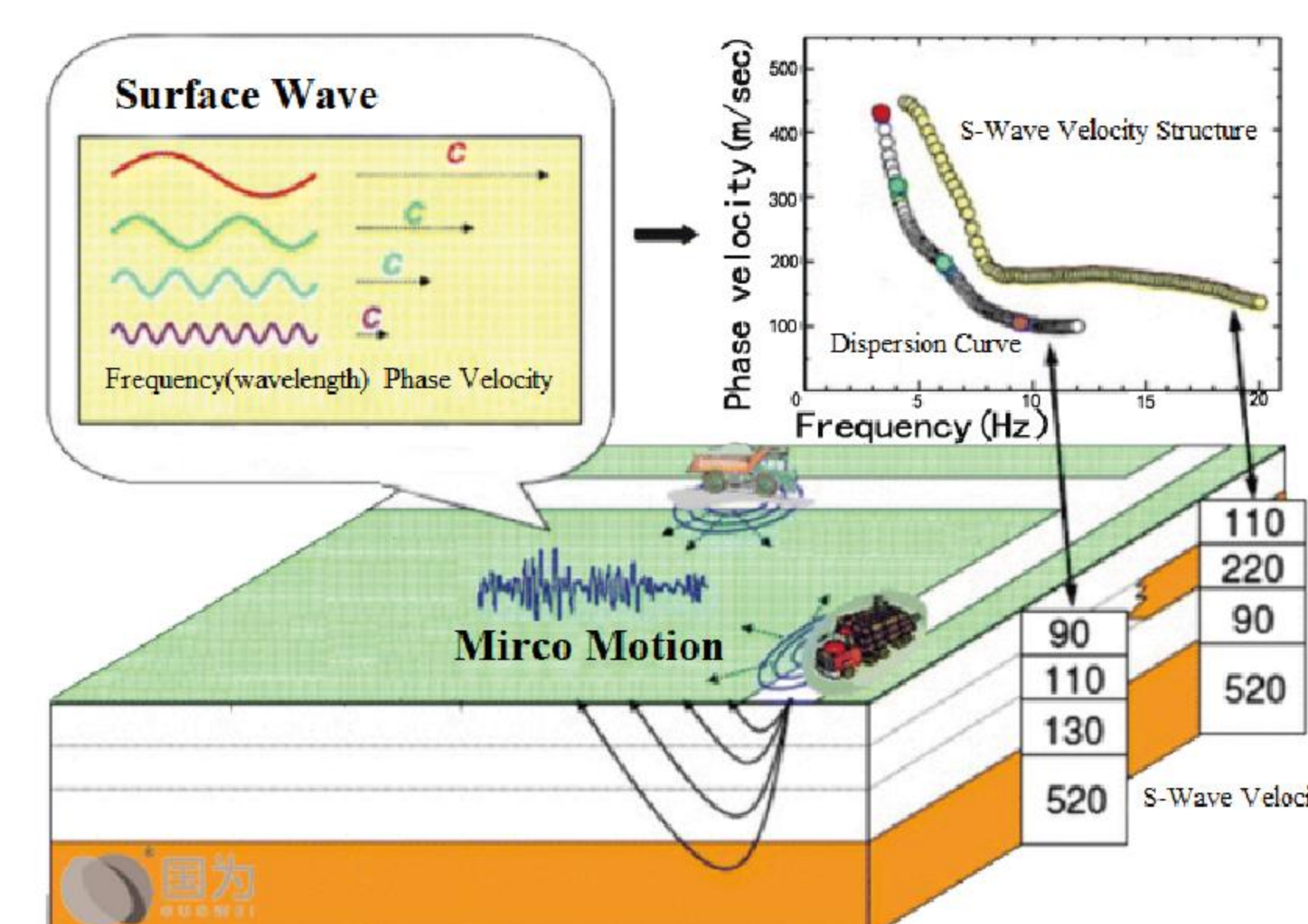
Combined with High-precision Nodal Seismograph and 2D/3D Processing Software

Surface Wave Detection

is a geophysical exploration method that utilizes wave dispersion characteristics of surface waves (mainly Rayleigh waves) to detect the thickness of various layers.

Can be roughly divided into two types:

Active Source Detection
and **Passive Source Detection**.



Active Source Detection, such as **MASW**, detect seismic wave signals propagating along underground propagation paths by applying small vibrations to the surface. This exploration method is suitable for detecting shallow geological layers (less than 15m), commonly used in urban engineering, infrastructure construction, pipeline detection etc.

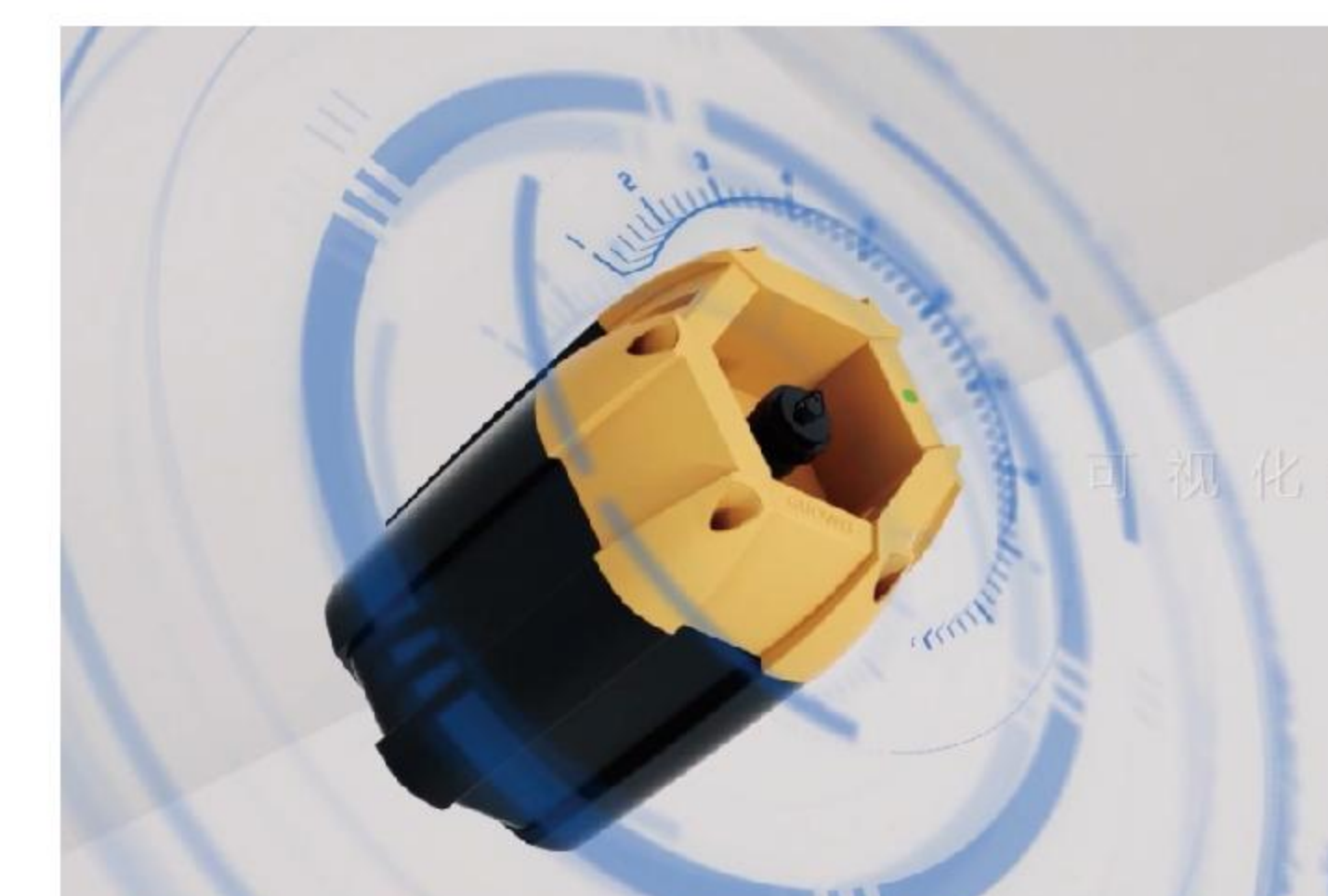
Passive Source Detection, such as **ESPA**C, use surface wave signals from the natural vibrations of the ground surface to detect underground structures and geological information. This exploration method is one of the most effective methods for obtaining S-wave velocity structures. It can be used for detecting mid to deep strata (max over 10km) which is commonly used in finding mineral resources or oil reservoirs.

GN309 Intelligent Node

High-resolution Acquisition System

HIGH-RESOLUTION

Built-in Single Component
2Hz 260v/m/s Geophone
High-SNR Data Quality
Bandwidth 5s-200Hz
High-precision 32Bit ADC
Ultra Low-noise level



ADAPTABILITY

Built in battery work 30days in normal mode, 7-10days in 4G mode.
Support extra three components
Support various of seismic source.

APPLICATIONS:

- 1. Engineering exploration:** urban underground space, roadbed boulders, urban drainage pipelines, detection of engineering crack.
- 2. Resources exploration:** lithology mutation (aquifer), coal and oil and gas exploration, etc.
- 3. Structural exploration:** karst, fault fracture zone, collapse column, goaf, real-time monitoring of overburden thickness.



Info Brazil: www.alphageofisica.com.br



Hefei Guowei Electronics Co., Ltd.

9th Floor,Building A, G3, Phase II, Innovation Industrial Park,No.2800, Innovation Avenue, High-tech Zone, Hefei city, Anhui Province, China

0086-0551-65327898/65327899

0086-0551-65327899

hfgwe@hfgwe.com

<http://www.hfgwe.com>

EQ Monitor

REAL-TIME PROCESSING

When using 4G mode GN309, the user

- can remotely adjust field parameters according to ground situation;(i.e., sampling rate, gain,and array arrangement)
- can use remote wake up and sleep function to start or end the data acquisition anytime;
- can use anti-theft alarm function and GPS location to search lost node in time;
- can control node status and download the data in real-time;
- EQ Monitor support active survey,passive survey, HVSR and real-time 2D/3D processing.

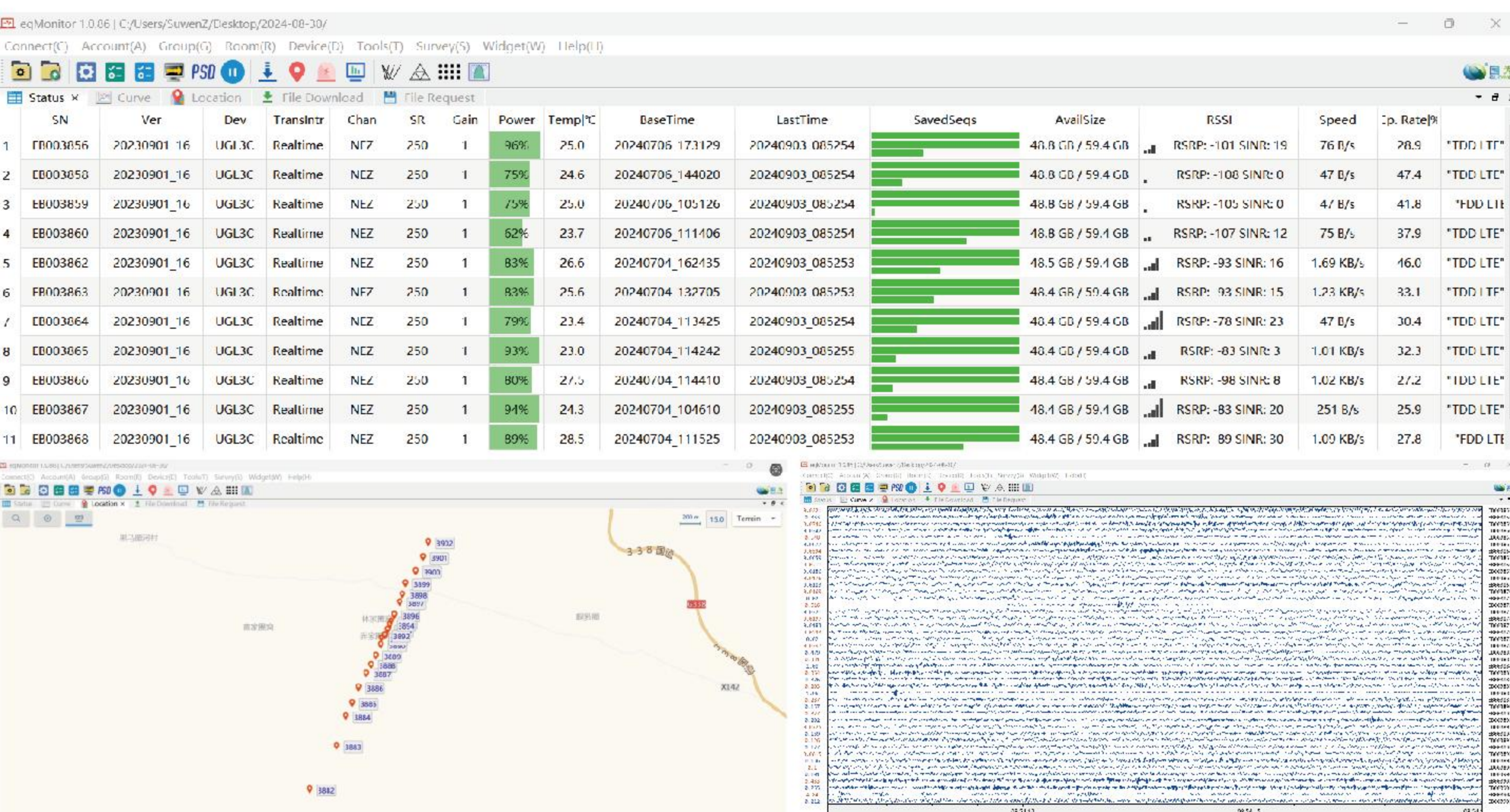
Ground Subsidence Detection 3D Map (China)

- # ESPAC Surface Wave Detection Method
- # GN309 4G Nodal Seismograph (2Hz 260V/m/s)
- # GeoTremors Professional Processing Software

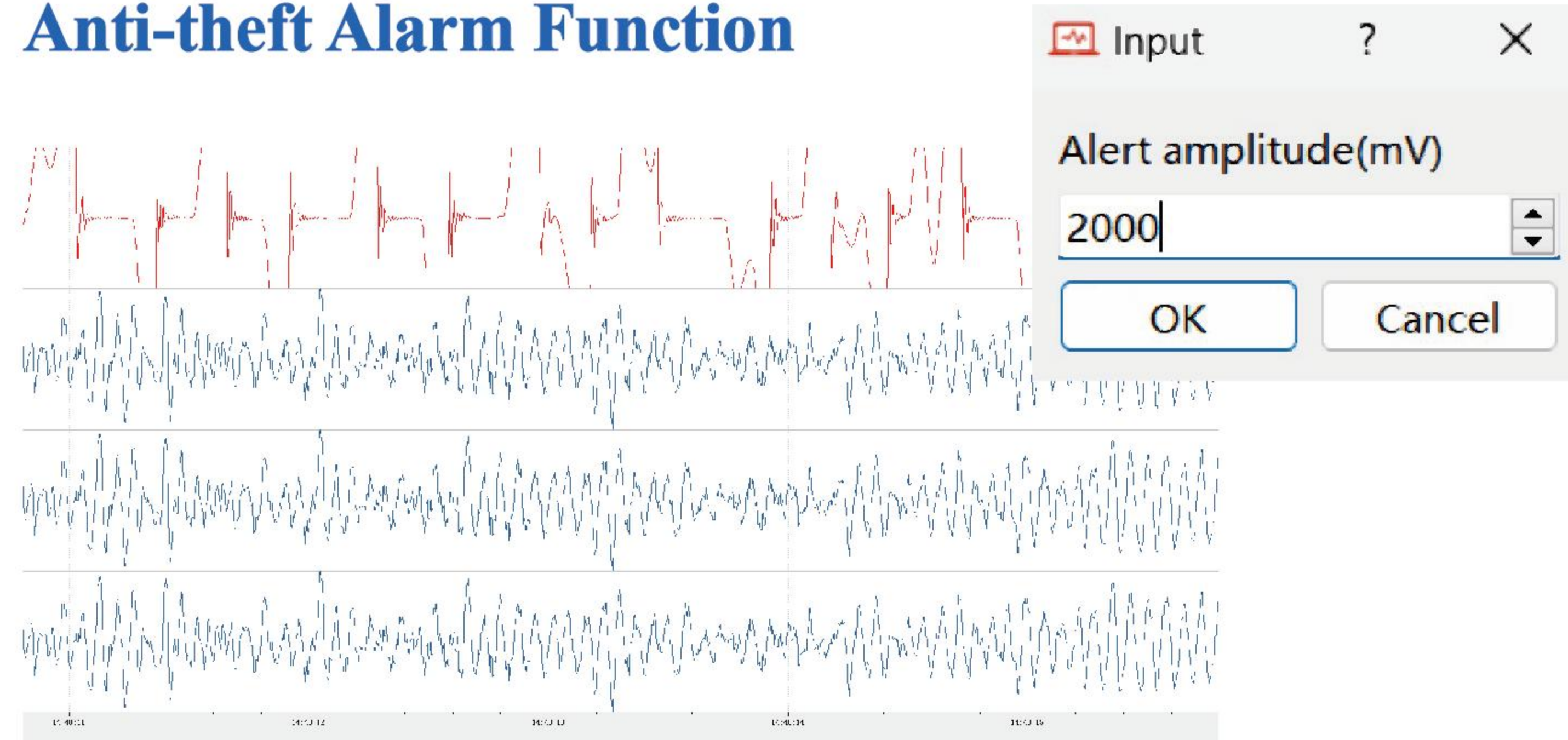
Large area geological subsidence suddenly occurred on the ground after drilling, causing obvious cracks in municipal facilities and buildings.

From the contour map, it can be seen that the low-speed zone in the target area is distributed in a multi-point dispersed manner, corresponding to the rich water zone and cavities generated after drilling.

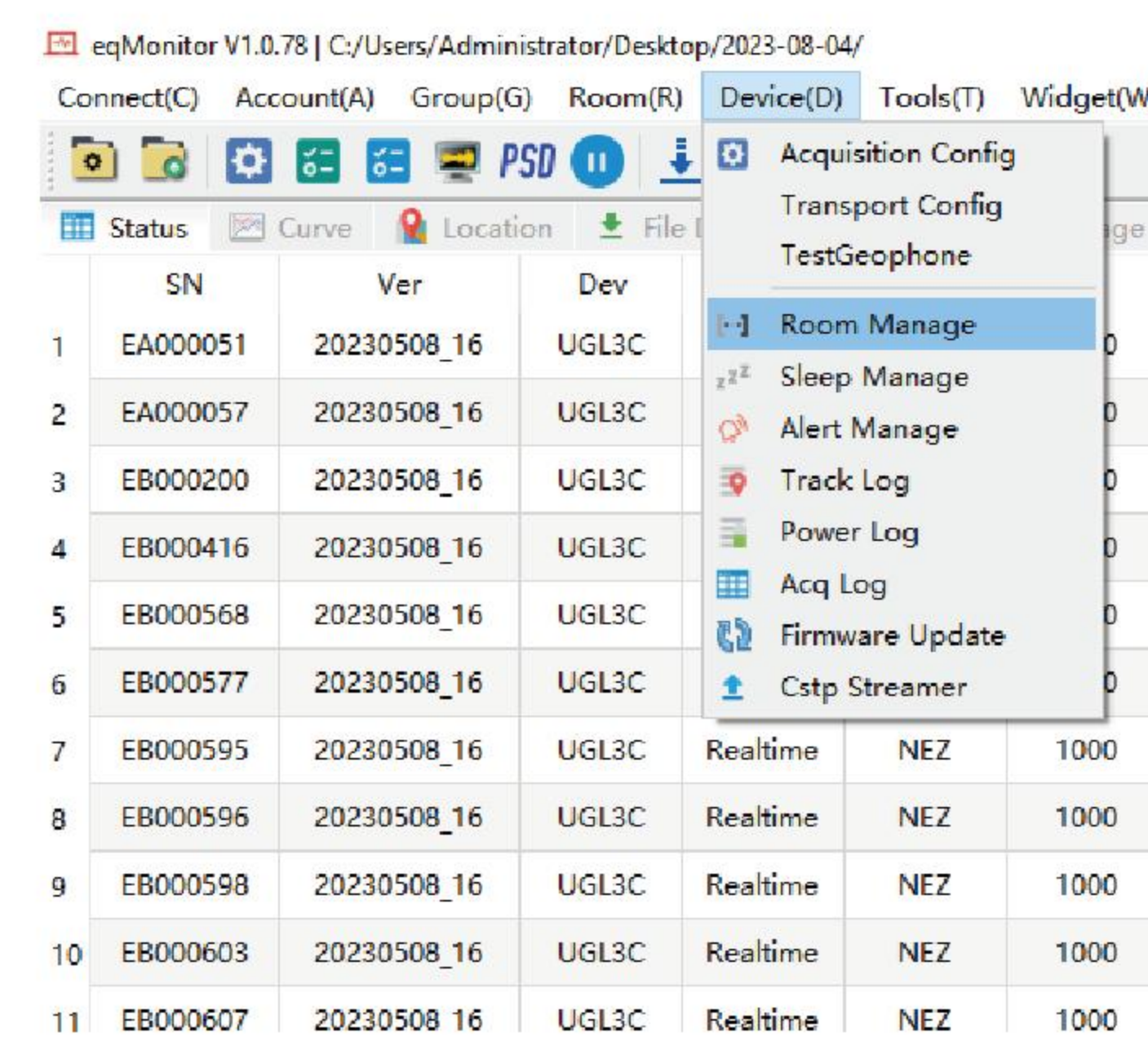
Real-time Data Transmission&Node Status Control



Anti-theft Alarm Function



Remote Wake up / Sleep Function



GeoTremors Professional

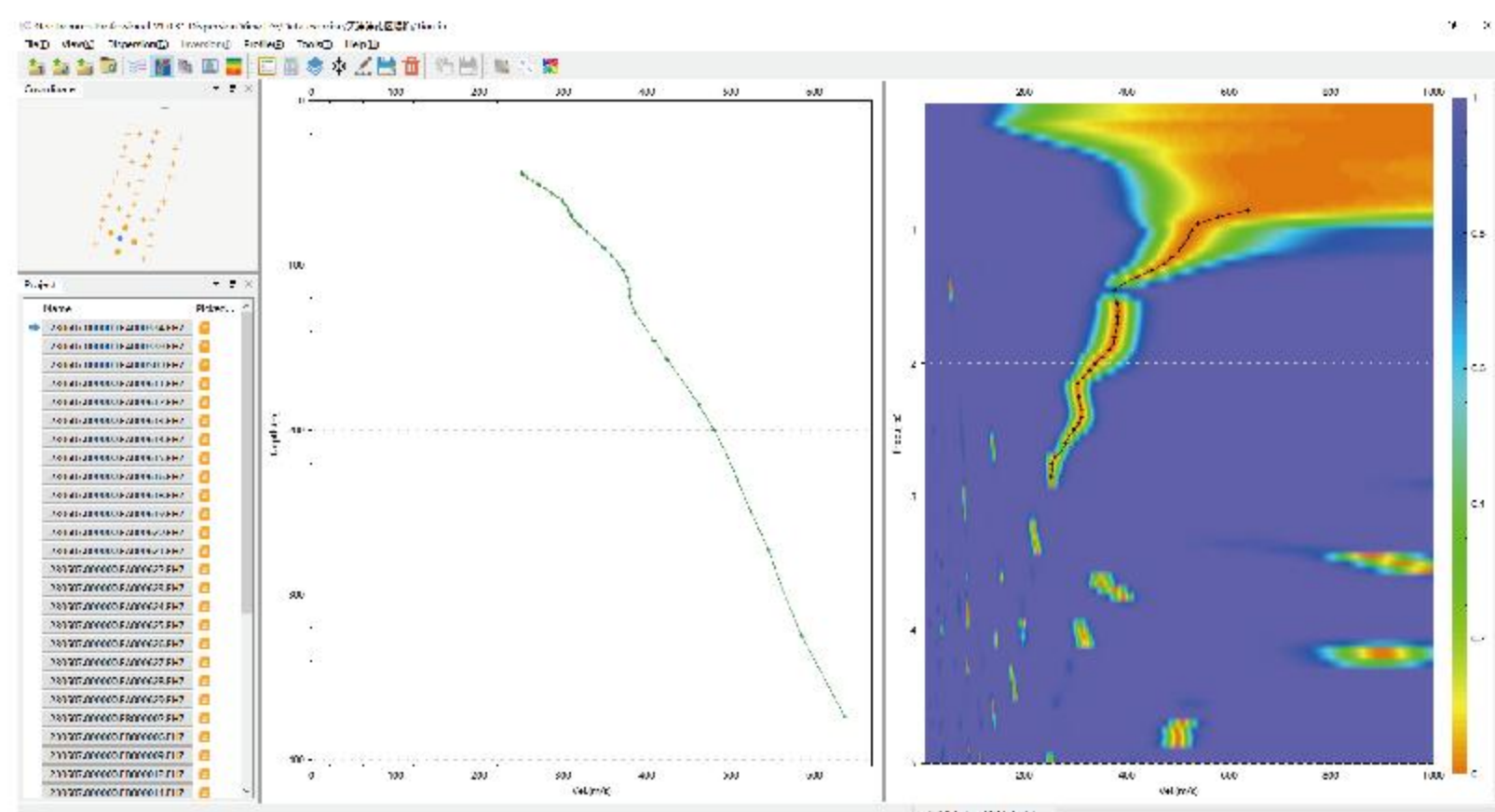
SURFACE WAVE PROCESSING SOFTWARE

Stable and Efficient Dispersion Inversion

The inversion of dispersion curves uses an efficient iterative algorithm, which can quickly and stably achieve the underground velocity structure. Its automatic batch calculation capacity makes batch 3D inversion possible.

Passive Source Dispersion Spectrum Analysis

Surface wave dispersion spectrum analysis supports passive source surface wave data, such as ESPAC, Inter-station Method, Phase Shift Method, and Extended Range Phase Shift Method. Exclusive signal compensation and denoising algorithms have been developed for low-frequency data with low SNR, resulting in deeper detection depth and better accuracy of passive source data processing.

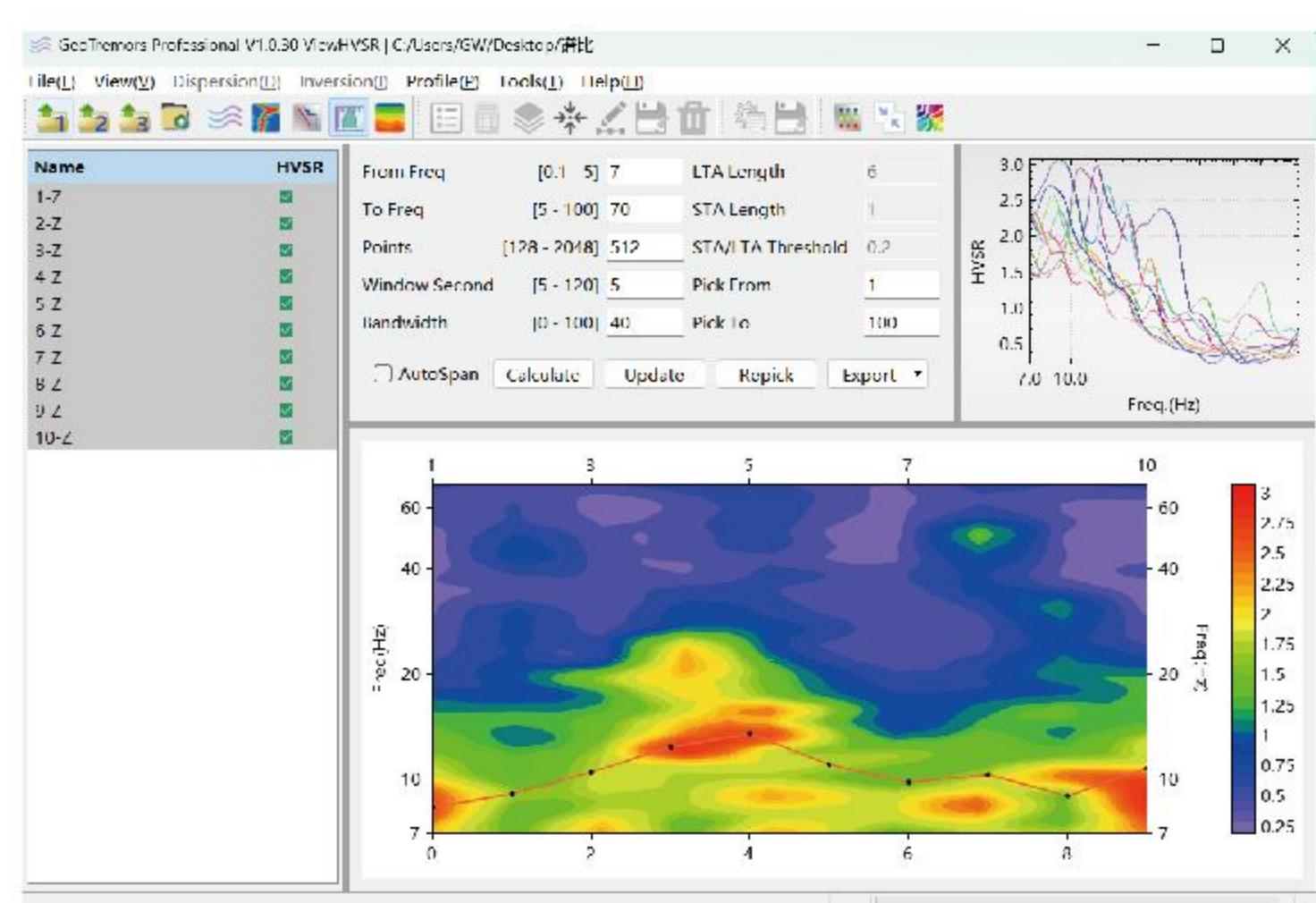


Active Source Dispersion Spectrum Analysis

Surface wave dispersion spectrum analysis also supports active and dual source surface wave data, and can combine active source high-frequency data with passive source low-frequency data to reduce shallow blind spots and improve shallow surface detection accuracy.

Support H/V Method

By combining the HVSR method with single line rolling construction, a 2D spectral ratio profile can be quickly obtained, and resonance peak results can be automatically screened to accurately calculate the depth of the bedrock.



Support Vs30 Vs100 Calculation

Based on the results of surface wave phase velocity, the Vs profile can be calculated automatically, which can be used to infer the type of underground structural layer.

