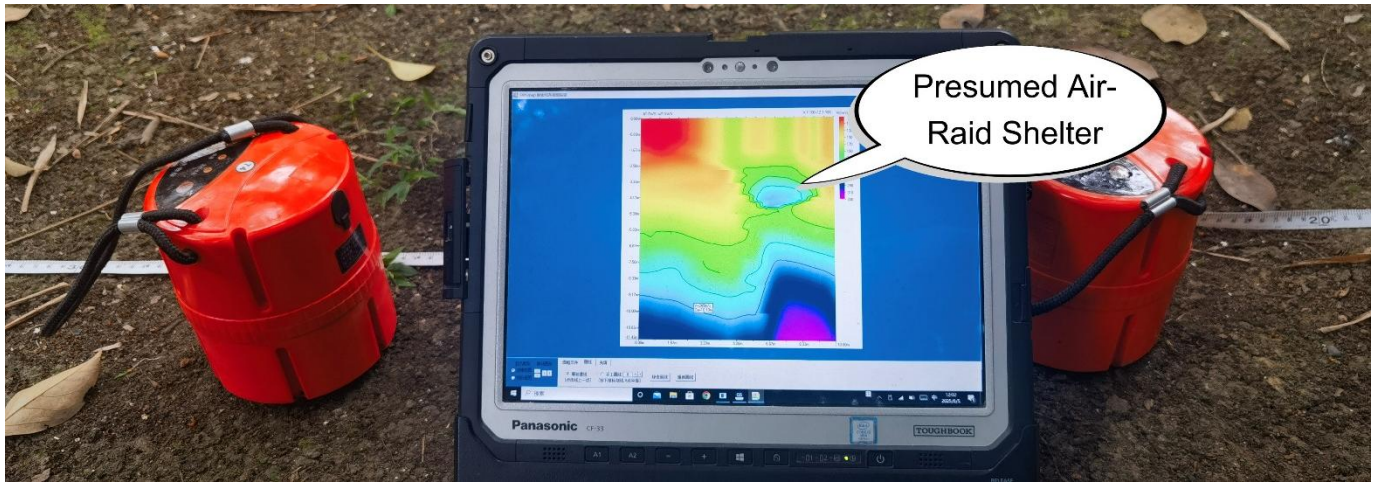
S5 Microtremor Wireless

Applications

- Urban geological exploration and exploration for urban underground space development
- Investigation of adverse geological conditions and geological hazards (landslides, mining subsidence areas, karst, dam hazards, ground subsidence, etc.)
- Investigation of hazards and seepage channels in earthen dams and dikes
- Investigation and safety assessment of tailings dams
- Detailed exploration of tunnel boring machine (TBM) routes
- Energy and mineral exploration
- Investigation of geological structures, geothermal and water source areas
- Investigation of backfill foundations and testing of the effectiveness of foundation reinforcement treatment
- Seismic safety assessment
- Various geotechnical engineering investigations, etc.

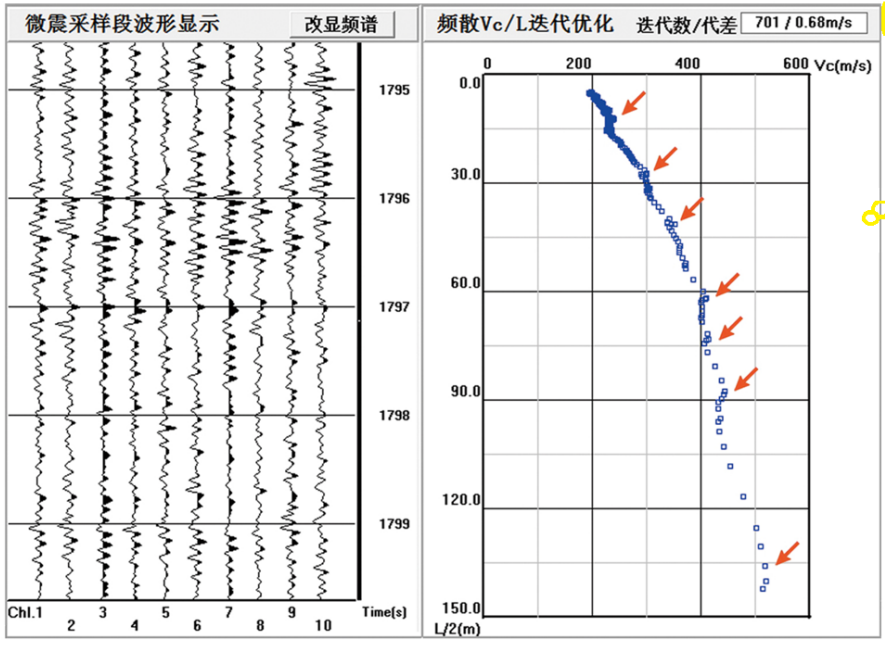
Main Features

- Real-time display of the cumulative superposition of the depth-velocity dispersion curve during acquisition. Engineers control acquisition time and control the data acquisition quality based on the three elements of the dispersion curve (inflection point, slope, and density of dispersion points), which solves the problem of blind acquisition in traditional Microtremor exploration.
- Wide range of exploration depths: from a few meters to several thousand meters (depending on the geophone frequency).
- High exploration accuracy: Dense measurement points enable high-precision detection with a horizontal resolution of about 1 meter.
- Wireless control and data transmission: support 4G + Wi-Fi.
- Data processing: AI-based intelligent processing with high automation. It automatically extracts dispersion curves and microtremor parameters, yielding unique processing results.
- No pre-defined stratigraphic model is required; real S-wave velocity of strata is obtained through automatic inversion.
- AI automatic processing improves efficiency by more than 10 times compared with manual processing. Profile results are generated in real time on site, providing geological information rapidly for emergency response.



Intelligent Data Collection

The process of the three characteristics of the dynamic display dispersion curve gradually becoming clear (Slope, inflection point, density of dispersion). The arrow points to the velocity-stratigraphic interface.

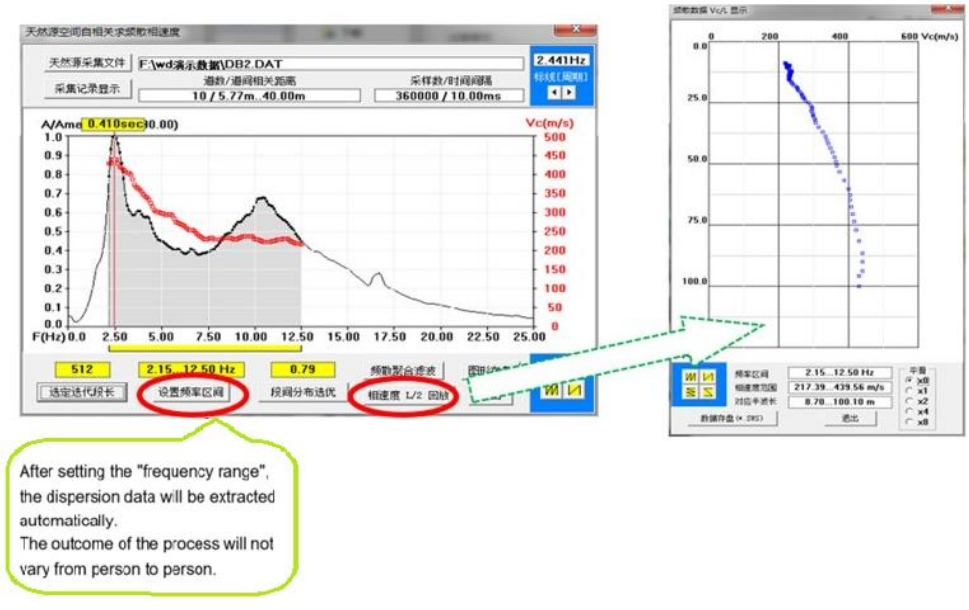


Waveform Record (Left Panel)

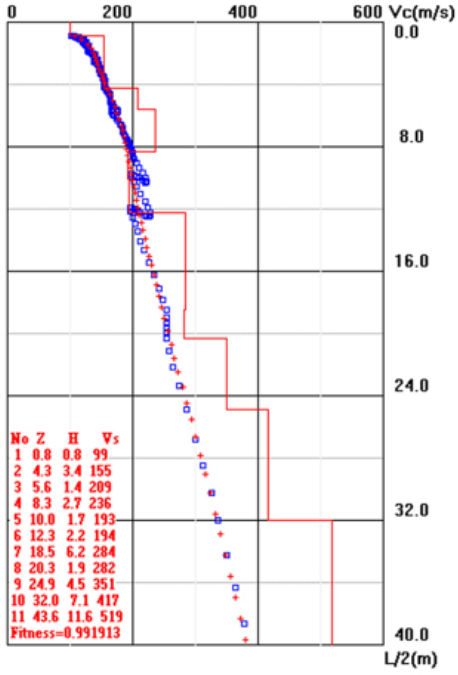
Dispersion Curve Convergence Process (Right Panel)

The intelligent data acquisition screen displays

Intelligent Extraction of Dispersion Curves



Extensive Shallow-layer Data



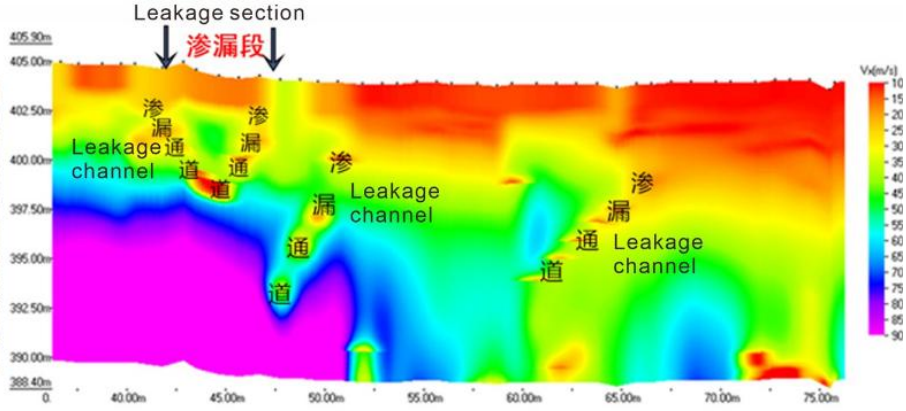
A unique algorithm is used to effectively eliminate near-source wave interference, and dispersion data is available at a depth of about 1 meter from the ground (related to geological conditions and seismic source information), enabling Microtremor exploration to measure both deep and shallow depths..

Case Studies

Dam Leakage Survey

Location: Sichuan, China

Field Environment



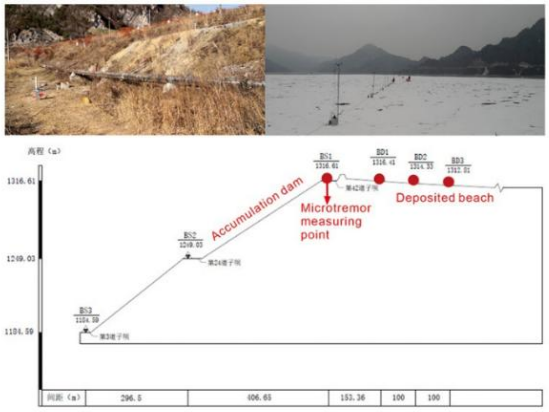
Vx Velocity Profile (Detection depth: 15 m)

Microtremor survey can quickly identify leakage channels in the strata of the leakage section, providing geological information for disaster treatment.

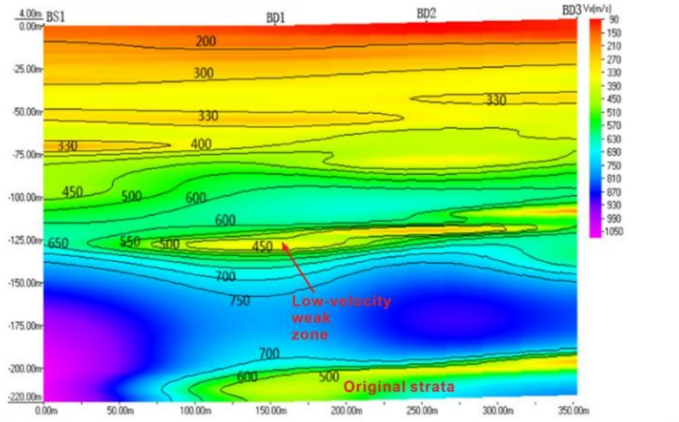
Case Studies

Tailings Dam Investigation

Location: Shaanxi, China



Field Environment



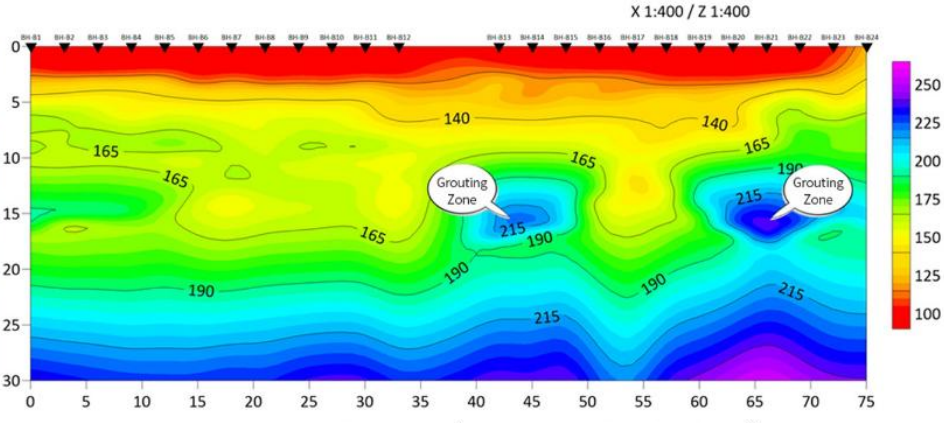
Vx Velocity Profile（Detection depth: 220 m）

The result map shows the sedimentary stratification of the tailings sand, and identifies the low velocity weak zones in the deep part of the dam body and the distribution of the original strata at the bottom of the accumulated dam.

Grouting Detection for Railway Subgrade

Location: Tianjin, China

Field Environment



Vx Velocity Profile（Detection depth: 30 m）

The microtremor B-scan technique is adopted to quickly identify the grouting influence range, with clear and intuitive grouting effects.