

What is new?

ITACA 3.0 has a renewed web interface and substantial changes in the database content and services.

Architecture of the database

The architecture of the database has been modified in order to archive additional information in 100 tables, managed by the open-source software PostgreSQL (<https://www.postgresql.org/>) which supersedes MySQL. The software that operates the database is entirely open source: Python (<https://www.python.org/>) for data archival and management and user authentication and AngularJS (<https://angularjs.org/>) for the web site design.

The new database architecture enables the association of multiple information related to the same object; for instance, a recording station can be linked to several geological maps and/or environmental noise measurements. In case of multiple sources of information, the database operators always recommend the most reliable.

Website

The graphic interface of the **ITACA 3.0** website has been renewed. The website is now available in two languages, Italian and English, and provides various tools to explore the database content (i.e. glossary, pop-up).

As in the earlier ITACA versions, the website contains three main sections related to waveforms, events, and recording stations. Each section provides several key fields, organized in thematic sections, to query the database. The queries outcomes are provided as tables or maps. OpenStreetMap (<https://www.openstreetmap.org/>) is the map layer for the visualization of event and recording stations.

The main updates of the *Stations* section are:

- A new *Seismological Analysis* section containing:
 - **HVRS**: Horizontal-to-Vertical spectral ratio of 5% damped acceleration response spectra;
 - **S-phase HVSR**: Horizontal-to-Vertical spectral ratio of S-phase acceleration Fourier spectra;
 - **Coda HVSR**: Horizontal-to-Vertical spectral ratio of coda acceleration Fourier spectra;
- The section *Site Parameters* has been enriched with new information. In particular, several $V_{S,30}$ estimates can be available for a single station, that can be obtained from: i) s-wave velocity measured with geophysical methods; ii) correlation with surface geology; iii) correlation with slope angle (Wald and Allen, 2007). For each estimate the EC08 (CEN, 2008) soil category is assigned. When the S-wave velocity profile is available, the soil category of a recording site is assigned according to the current Italian seismic code (NTC, 2018).

- The section *Photogallery* collects photos of the recording stations, displaying housing, instrumentation, and surrounding landscape.
- The section *Documentation* archives the station report which summarize all the relevant information about stations available in the database, as well as other documents related to soil characterization or local site response.
- The main updates of the section *Events* are:
 - The section *Shakemap* shows the shaking maps in terms of Peak Ground Acceleration (PGA), Peak Ground Velocity (PGV), and Spectral Acceleration (SA) for T=0.3, 1, and 3s. The Shakemaps (<http://shakemap.rm.ingv.it/shake/>) are reviewed and published by the INGV;
 - The section *Moment tensor* which shows the solutions of the moment tensor, including the beach ball representation;
 - The section *Source* with the information regarding the causative fault geometry and the nucleation point coordinates.
- The main updates of the section *Waveforms* regard the display of time histories and spectra and the addition of new key-fields for the waveform selection.

Data and Services Access

The User may have access to data and services distributed through the ITACA web site with different modes:

- **Anonymous User:** Identification or accreditation are not required (only metadata exploration);
- **Registered User:** Identification or accreditation required (metadata exploration and waveform download).

The registration/accreditation can be accomplished through: i) ITACA registration form; ii) Google; iii) ORCID.

Data Format

Waveforms and response spectra can be either downloaded in ASCII or ASDF (<http://seismic-data.org/>) binary format.

EC8 soil categories

In ITACA3.0 the EC8 sil categories inferred from surface geology are no longer marked with an '*'. In the new version the EC8 class is always coupled with the description of the method used to derive the soil class