# GEOTECH INSTRUMENTS, LLC

CARACTERISTICAS

- **Configuración escalable**

- **Totalmente automatizado**

- **Windows 2000/XP**

SMARTQuake® es una aplicación completamente automatizada para el procesamiento de datos de de un terremoto.
Abarca la detección del del acontecimiento, la confirmación en red, localización del hipocentro, local *vs* la descripción distante del acontecimiento.
La ubicación de terremotos locales es ubicada por la calculación magnetica M_{WA} o M_D localizada por la inversión de momento del tensor y por la determinación de parámetros de la fuente.
Para acontecimientos lejanos se calcula el m_b de la magnitud de la onda.
Todos los resultados, mapas epicéntricos y formas de ondas pueden ser impresos con impresora postdata.
Los resultados de ubicación y la fuente de parámetros pueden ser difundidos por por correo electrónico
Una interface web y un autoDRM son opcionales.

SMARTQuake®

Procesador automatizado de terremoto
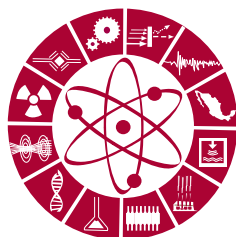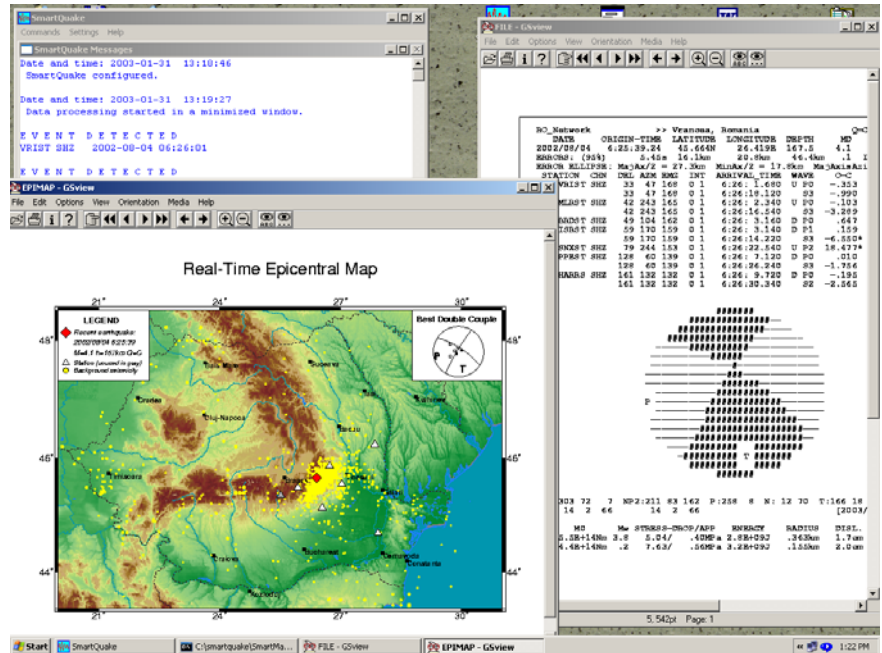
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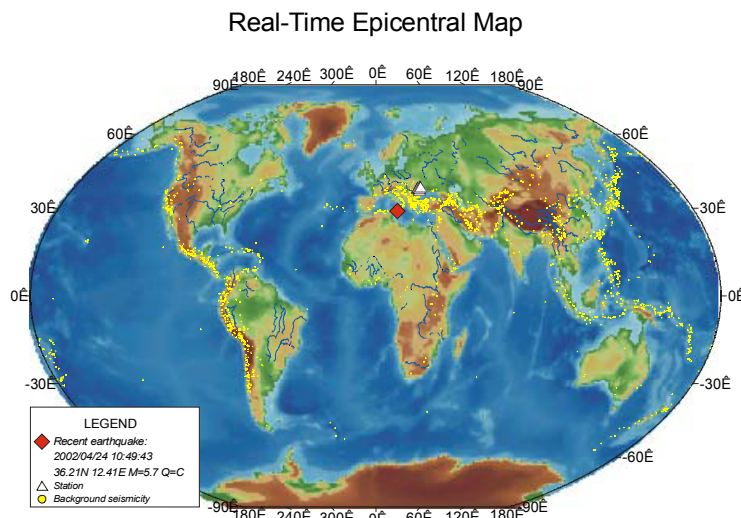Serv. 01800 024 1958
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SMARTQuake® SPECIFICATIONS

El paquete del programa **SMARTQuake®** fue originalmente desarrollado para trabajar junto con los instrumentos Geotech **SMARTGeoHub® Data Server**, which in turn collects data from remote Geotech Instruments' **SMART-24D®** digitizers, **SMART-24R®** recorders, and **SMART-24A®** accelerometers. In particular, the automatic arrival time picks are displayed by the Geotech Instruments' **SMARTGeoViewer®** waveform display client.

However, **SMARTQuake®** is also a stand alone application and seismic data can be input from any continuous file data acquisition system, like the Geotech Instruments' Intelligent Communication Processor (ICP). The only requirement is that the continuous data files are relatively short, between 10 seconds and 100 seconds, depending on the array aperture.

SMARTQuake® starts by picking arrival times on selected and pre-filtered channels. The waveforms after the picks are analysed to discriminate between local and regional earthquakes, and teleseisms. S waves are also picked in case of local earthquakes. Different location and magnitude determination routines are then invoked: iterative Geiger method for local/regional earthquakes, and plane wave method for teleseismis. Wood-Anderson M_{WA} or duration magnitude M_D is computed for local earthquakes and m_b for teleseisms. Location results, waveforms with picks, and epicentral maps are output on a PostScript printer. Event files are archived and converted to common seismological data formats like GSE or SAC.

The location results are sent by email and/or SMS to a list of addresses/numbers in a few minutes after the earthquake detection. The emails are already formatted as required by some of the most important seismological centers (e.g. IDC, NEIC, EMSC, Swiss Seismological Service, etc).

Real-Time Epicentral Map

LEGEND
◆ Recent earthquake:
2002/04/24 10:49:43
36.21N 12.41E M=5.7 Q=C
△ Station
○ Background seismicity

An optional module in **SMARTQuake®** performs moment tensor inversion for local earthquakes based on spectral amplitudes of body wave trains. The inversion applies constraints for zero trace (or double couple source model). The output includes the moment tensor components, its principal P, T and B axes, the strike, dip and slip of the nodal planes, the scalar seismic moment, standard errors, together with a Wulf projection on the lower focal hemisphere, all appended to the outgoing emails. Moment magnitude M_w, stress-drop, source dimension, and energy released are also calculated automatically.

SMARTQuake® can be scheduled to send periodically state-of-health email messages to the operator, and even to notify in case of LAN breakdowns. Other features are an optional circular buffer, an AutoDRM, and a web interface.

SMARTQuake® can also accept the input data from a set of field disks, automating processing of data obtained from temporary deployments of portable recorders.

An optional module is **SMARTShake,** designed to automatically generate shake maps if acceleration data channels are present. These applications are computationally and I/O intensive, and especially in case of large networks, should run on a dedicated networked Windows computer.