



0.1 PWL 1.0

Personal WaveLab

0.1.1 An Object-Oriented workbench for Seismogram Analysis on Windows systems

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Personal WaveLab 1.0 (PWL) is a seismic time-series processing package for Windows-based personal computers. Our objective is the development of a stand-alone application that allows for “basic” digital seismic waveform analysis. Because of its architectural characteristics it can be used for more complex and power featured applications. An expanded version of PWL, called *SisPick!*, is currently in use at the *Istituto Nazionale di Geofisica e Vulcanologia* (Italian Institute of Geophysics and Volcanology) for real time monitoring of earthquake occurrence driven toward Civil Defence purposes.

Various versions of PWL evolutions have been employed in the United Nations supported *Nyrangongo Project*, Congo, and during the Stromboli volcanic emergency in Summer of 2002.

PWL features an Object-Oriented design, it is easy to use while preserving computational speed, minimum disk space requirements and no third-party developed components (including ActiveX).

An effective feature of PWL is that the adopted design technique allows for easy expansion and link to any earthquake location package or data acquisition system (see

Earthworm). At present, compliance with Hypo Family routines is guaranteed as phase interpretations can be saved in HypoInverse2000 formatted files.

An interesting feature is the ability of showing in a single area (Event Graphical Area: EGA) all waveforms related to an event with no restrictions of number or dimension of files. At present, most of seismic analysis systems can display at most one trace or three components of the same station. Moreover, PWL can show vertical components in its EGA and detailed three components for active station in a second window activated by a double-click. All phase picking and editing can be performed in both windows. In the three components view a vertical picking bar covers the three waveforms during the analysis in order to help the user in phases identification. It's possible to switch from a station to another just by a mouse click.

Another interesting function is given by "waveforms grouping and synchronisation". All time series shown in the EGA can be synchronised and grouped in order to apply modification to all traces simultaneously. Functions like zoom, crop, offset correction and filters can be applied to a single trace or to all the traces. Grouping and synchronisation are selected by default in the three components window.

Many shortcuts are implemented to speed up most frequent operations.

This makes the application software versatile and usable during the seismogram reading in seismic crisis as well as for offline analysis for seismic bulletins.

In addition, adoption of the Windows environment spares the user from scripting or complex interaction with the system while making it suitable for educational purposes.

PWL is under constant development in order to answer the needs and suggestions of its users.

MS Visual Basic 6 source code, installation package, test data sets and documentation are freely available on a dedicated web site <http://sispick.ingv.it>.