

New Version of SeismicHandler (SHX) based on ObsPy

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Abstract

The command line version of SeismicHandler (SH), a scientific analysis tool for seismic waveform data developed around 1990, has been redesigned in the recent years, based on a project funded by the Deutsche Forschungsgemeinschaft (DFG). The aim was to address new data access techniques, simplified metadata handling and a modularized software design. As a result the program was rewritten in Python in its main parts, taking advantage of simplicity of this script language and its variety of well developed software libraries, including ObsPy. SHX provides an easy access to waveforms and metadata via arlink and FDSN webservice protocols, also access to event catalogs is implemented. With single commands whole networks or stations within a certain area may be read in, the metadata are retrieved from the servers and stored in a local database. For data processing an extended set of SH commands is available, as well as the SH scripting language. The command set of SHX is extendable using this SH language scripts or via additional Python modules. A graphical user interface based on wxwidgets is currently in development. The program is open source, tested on Ubuntu Linux operating systems. Documentation and download is found at the SeismicHandler website¹.

¹<https://www.seismic-handler.org> (QR below)

SH/SHX website



SHX gallery



Example Python code

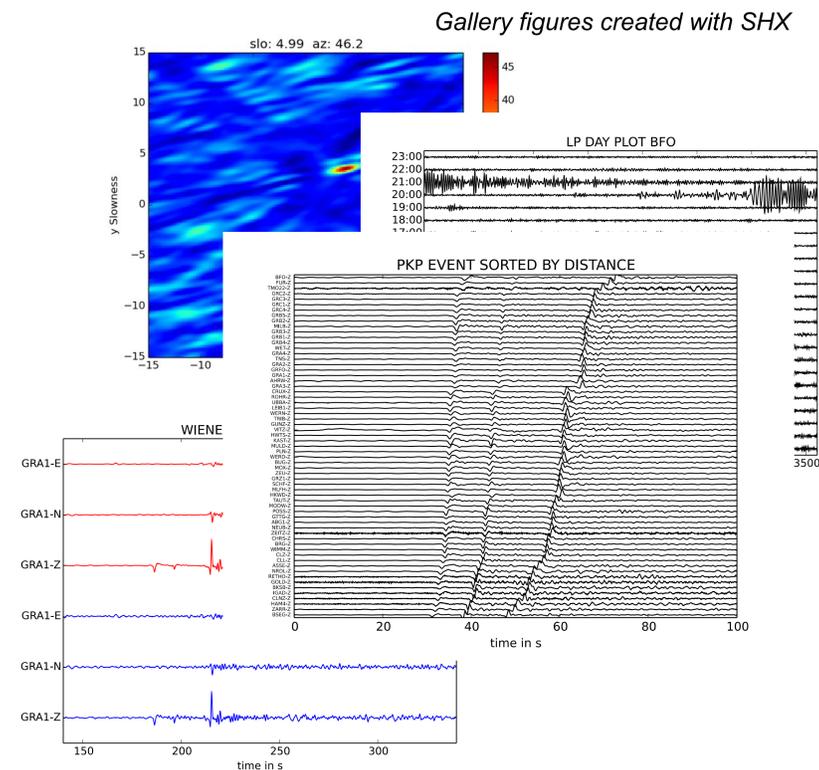


Command Line Examples

The command line interface of SHX is compatible to the old version of SH and also offers the possibility to write own commands scripts. While SHX is based on Python it opens access to a huge set of Python libraries like matplotlib and the seismic toolbox ObsPy (<https://docs.obspy.org/>). Only a few lines of SHX code are necessary to create the example plots shown below this text. Please visit the gallery page² of SHX to see the example codes. Besides command scripting own code can also be integrated using Python language (see example command "wiener"³ implementing a wiener filter using scipy).

²<http://www.seismic-handler.org/wiki/ShxGallery> (QR below)

³see QR code below



Graphical User Interface

The graphical user interface for SHX currently is under development. It provides menus and mouse operations like phase picking and dragging as well as an event parameter interface. Taking elements of the SHM analysis program it e.g. also provides a zoom window for a selected trace. One of the goals of this interface is to offer the possibility to interactively analyze events in an efficient way. The GUI is implemented as a separate thread in addition to the command line interface which is always present. The currently available menu options cover data input and output, trace display management, basic trace operations, array and filter operations, phase picking and computation of theoretical phases, ml determination and event input/output. An interface to QuakeML formatted event data is in preparation. Different event locators will be available, the interface to LocSAT is already implemented.

Snapshot of SHX with GUI

