array_coherence

Compute the Coherence Squared between a suite of SAC files.

Purpose/Scope

This script computes the coherence of an event signal between a set of seismic array elements. The data are expected to be in SAC format, and several header vales need to be set. The values are, at minimum, *stla,stlo,evla,evlo*, and some time reference *(e.g. a,t0,o)*. Although the header value (*b*) may also be used.

This version only uses scipy.coherence, which uses Welch's method to estimate the spectra. The multitaper estimation method is currently turned off.

The script makes a suite of plots:
1. A record section of each time series sorted by distance, along with the array beam
2. The Two-Station coherence as a function of frequency for each station pair
3. The Coherence as a function of interstation distance at specific
frequency values.

Install

Clone source package
```
git clone http://github.com/flyrok/array_coherence
```

Or, unpack the zip file ...

Install with pip after download
```
pip install .
```

Install in editable mode
```
pip install -e .
```

Python Dependencies

The following dependencies are required. The `setup.py` will try to install them.

python>=3.6 (script uses f-strings)
obspy (https://github.com/obspy/obspy/wiki)
numpy
PyQt5
pyqtgraph

Usage/Examples

The main driver is a INI configuration file. Use the `-h` option to print an example. The INI file is editable within the UI.

It is recommended to run the script with the `-v` to understand some of the output. It is very verbose. Turn on debugging with `-vv`, if things go wrong.

To see help and an example INI file:
```
array_fk -h
```

To see version:
```
array_fk --version
```

To run it:
`array_fk -f *.sac