Orientation estimates of horizontal components for Alaska Amphibious Community Seismic Experiment (AACSE) ocean-bottom seismometers

March 9, 2021

Method. Rayleigh Wave Arrival Angles [DLOPy; Doran and Laske, 2017]

Code. https://igppweb.ucsd.edu/~adoran/DLOPy.html.

Implementation. The default DLOPy input parameters were used. The data window was selected for each site using the spectrograms of the three seismometer channels (HHZ, HH1 and HH2).

OBSIC Horizontal Component Orientation Convention

Left-handed coordinate system with positive Z pointing upwards and positive horizontal components H1 and H2 as shown in figure.

θ shows the convention for the DLOPy orientation estimates: the clockwise angle from North to H1, from 0 to 360°.
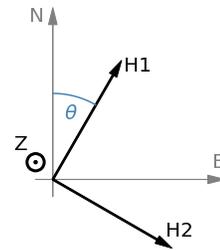
Results. In accompanying file AACSE_orientations_DLOPy.csv. Spreadsheet has two header rows and sites with no DLOPy results have been omitted.

Column	Description
Site	Network is XO.
Orientation	In degrees, as defined above and by Doran and Laske [2017].
Uncertainty	In degrees, as defined by Doran and Laske [2017].
Number_of_earthquakes	Number of unique earthquakes used.
Number_of_measurements	Total number of measurements used across earthquakes, frequency bands and wavetrains (R1 and R2).

Limitations. These are semi-automated results using a single method with default input parameters. Other methods may yield more precise or more accurate results, especially for sites with high noise or low data quality.

Doran, A. K., and G. Laske, 2017, Ocean-bottom seismometer instrument orientations via automated Rayleigh-wave arrival-angle measurements, Bull. Seis. Soc. Am., **107 (2),** *691-708, doi: 10.1785/0120160165.*