



Experiment number: [PIC 202210](#)

Date archive has been updated: [December 27, 2023](#)

This archive has been updated according to the attached announcement to this report.

Network Code: 2S.2022

Assembled ID: 23-011

Archive type:

- PH5

Implemented changes:

- Z-dip has been updated from +90 to -90

Where the correction was implemented in the archive:

- PH5 master (PH5)

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Version #	20231120
Publish Date	2023-11-20

Announcement Title:

SmartSolo archives flipped polarity (IGU-16HR 3C 5Hz)

Announcement Content:

Dear EarthScope Community and PASSCAL PIs:

In September of 2023 we discovered that SmartSolo node (IGU-16HR 3C, 5Hz) data archived from PASSCAL experiments has a non-standard polarity on the Z-channel relative to the down-positive industry geophone convention. Details of this discovery and the steps that will be taken to correct this discrepancy, which will affect the existing and future archives, are outlined below.

Issue

The expected polarity for data archived from PASSCAL experiments are as follow:

- Broadband seismometer – Up (Z-dip = -90), North and East motion produce a positive polarity.
- Geophone – Down (Z-dip = +90), North and East motion produce a positive polarity

Data archived, both PH5 and SEED, prior to October 05, 2023 from PASSCAL experiments using the SmartSolo nodes have the following polarity and metadata mismatch:

- Up (Z-dip = -90), North, and East motion produce a positive polarity
- SmartSolo 5Hz geophone Z-channel metadata incorrectly describes the existing timeseries polarity. i.e. The data are Z-dip = -90 and the metadata are Z-dip = +90.

Corrective Measures

We will take the following steps to correct the existing archives (October 05, 2023 and prior):

- Metadata for all SmartSolo archives will be updated to accurately reflect the polarity of the associated Z data. This means Z-dip will be updated from +90 to -90.
- The timeseries data will not be corrected; meaning already-archived data will remain as-is, and retain up-positive polarity (Z-Dip = -90), matching that of the updated metadata.
- A report will be attached to all affected and edited archives for future users to be aware of this convention.

Future Archives

We will take the following steps when archiving future SmartSolo node experiments (Effective October 05, 2023):

- All SmartSolo data will be archived using the down-positive industry convention for geophones regardless of archive format.
- Metadata will correctly describe a Z-dip of +90.

Note

- Only SmartSolo Z-channel data is affected. Existing metadata correctly describes the horizontal channels of all SmartSolo experiments, and Fairfield archives are wholly unaffected.
- Sensors (also referred to as geophones) with industry standard conventions in the PASSCAL pool of equipment are: L-22, L-28/Y-28, Sercel 40Hz, and all-in-one units; Fairfield ZLand 3C nodes and SmartSolo IGU-16HR 3C

Signature:

EarthScope Primary Instrument Center