

# ***AE monitoring of a true triaxial test- Imperial College London example - Locations***



*Microseismic Geomechanics: Increased understanding; reduced risk*

- InSite™ Lite is the free version of Itasca Consulting Ltd.'s InSite Seismic Processing software suite, provided with limited functionality and features.
- The examples shown here are taken from ICL and its partners projects.
- InSite's proprietary project (\*.pcf) files contain all the configuration, event information and links to waveforms necessary to run a project in InSite. Double-clicking on the .pcf project file launches the InSite software application.
- The InSite project waveform data (\*.esf) files include the results from the data processing. These files are imported for the project (.pcf file) through the data import management tool in InSite. Please note that not all of the available example projects are provided with example waveform data.
- For information on the operation of the InSite software, please refer to the product help files.
- For information on purchasing the full version of the InSite software, please contact us at [support@itasca.co.uk](mailto:support@itasca.co.uk)

- This example uses AE location data from a true-triaxial test on a cubic sandstone sample. Source mechanisms have been determined for these events.
- The data is from a laboratory experiment at Imperial College London for the EC-funded SAFETI project.
- The AE imaged the creation of fractures that grew as uniaxial stress was increased. The events were compared with model data.
- The following slides give you some options to try in the software.

*It's a good idea to ...*

... run through the “ImperialLab” demo presentation first as this gives a more thorough overview of the Location Visualiser and Mechanism Visualiser.

# Navigation: Data Visualiser

InSite-Lite (x64) - ImperialLab\_locations\_20100309

File View Project Tools Events Export Help

Global Button Bar

1 Components Loaded

9127 Events Loaded from Component imperiallab event data

**Data Visualiser**

Setup

Waveforms

Waveform-Moveout

3D Visualiser

Mechanisms

Stream

AE Dashboard

Stream Dashboard

Processing Settings

Triggering

Charts

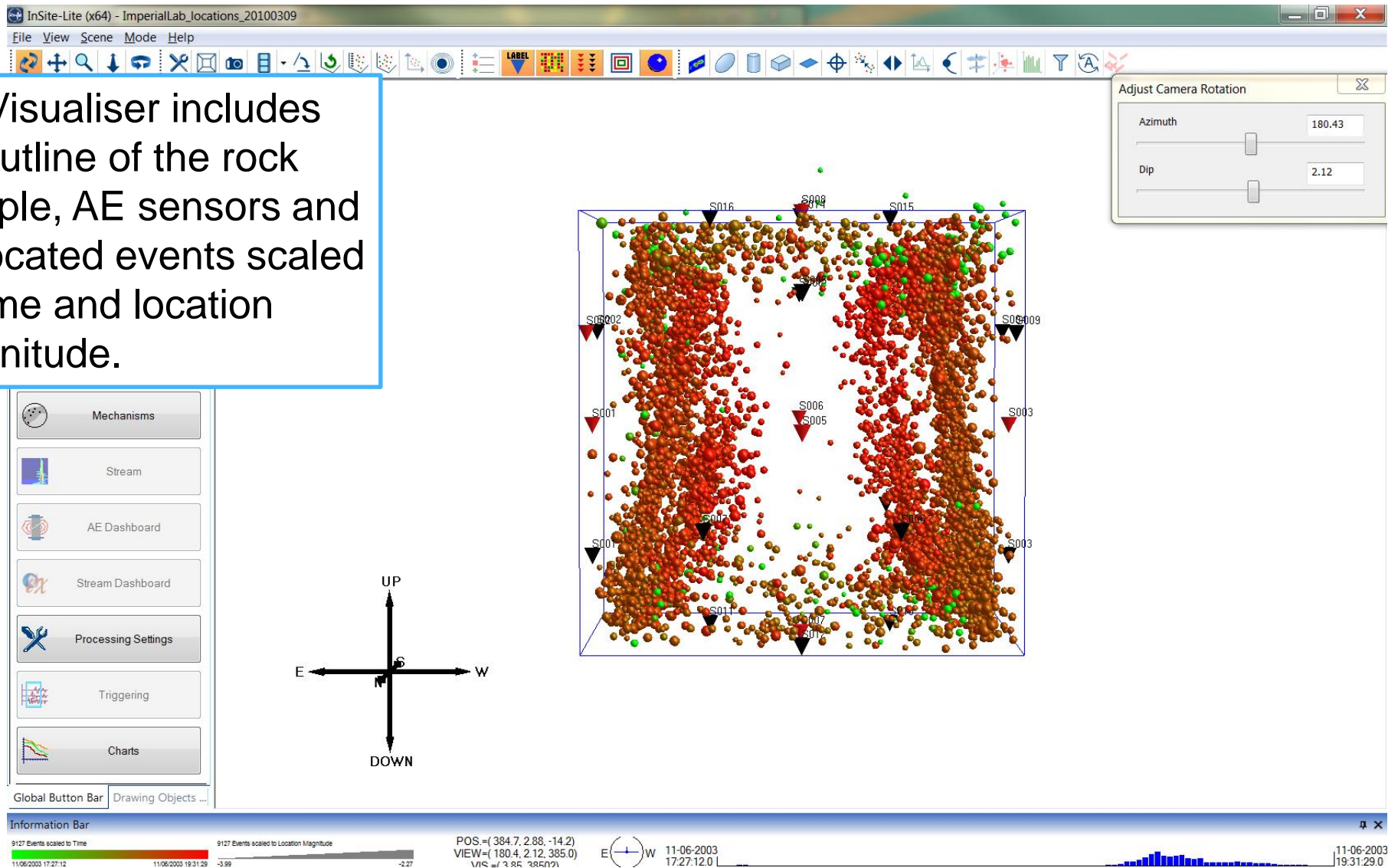
Name	Enab...	Date	Time	Type	Num...	Date	Time	LocalTime	La...	Enab...	North	East	Down	Units	LM...	Wavefor...	DB	N...	N...	N...
imperiallab event...	✓	11-06-2...	17:27...	Ev...	0001	11-06-2...	18:48:54.6500...	18:48:54.6500...	E#1	✓	21.3...	0.910...	22.9...	0.001	-3	×	×	0	0	12
				Ev...	0002	11-06-2...	18:48:55.5300...	18:48:55.5300...	E#2	✓	-19.4...	-13.4...	21.8...							
				Ev...	0003	11-06-2...	18:48:55.5900...	18:48:55.5900...	E#3	✓	14.8...	2.8500	24.0...							
				Ev...	0004	11-06-2...	18:48:56.0800...	18:48:56.0800...	E#4	✓	-15.1...	21.1...	-23.9...							
				Ev...	0005	11-06-2...	18:48:56.2400...	18:48:56.2400...	E#5	✓	-5.22...	-20.2...	21.5...							
				Ev...	0006	11-06-2...	18:48:57.7300...	18:48:57.7300...	E#6	✓	-8.36...	19.2...	-19.9...							
				Ev...	0007	11-06-2...	18:48:58.0600...	18:48:58.0600...	E#7	✓	16.9...	-15.9...	23.3...							
				Ev...	0008	11-06-2...	18:48:58.1700...	18:48:58.1700...	E#8	✓	-4.50...	16.0...	2.280...							
				Ev...	0009	11-06-2...	18:48:58.6100...	18:48:58.6100...	E#9	✓	15.1...	9.6600	5.940...							
				Ev...	0010	11-06-2...	18:48:58.8300...	18:48:58.8300...	E#...	✓	-13.0...	3.9100	15.6...							
								8:59.4300...	E#...	✓	17.4...	0.360...	20.4...							
								9:00.9100...	E#...	✓	-23.3...	15.4...	21.2...							
								9:01.6300...	E#...	✓	21.2...	-0.58...	-21.5...							
								9:02.4000...	E#...	✓	-6.86...	15.9...	-17.9...							
								9:03.1700...	E#...	✓	-0.86...	-13.1...	-3.32...							
								9:03.2200...	E#...	✓	-20.7...	-12.0...	21.9...							
								9:03.6000...	E#...	✓	-6.09...	-22.1...	12.5...							
								9:04.1000...	E#...	✓	14.1...	-18.1...	4.320...							
								9:05.9100...	E#...	✓	21.3...	-5.36...	-20.4...							
								9:06.0200...	E#...	✓	-21.3...	-9.87...	21.8...							
								9:07.4500...	E#...	✓	-22.2...	3.2200	21.1...							
								9:07.6100...	E#...	✓	20.7...	-18.4...	-22.3...							
								9:07.7800...	E#...	✓	21.4...	1.2800	-20.9...							
								9:08.3300...	E#...	✓	18.1...	11.8...	20.7...							
								9:08.6000...	E#...	✓	9.7600	-18.7...	13.0...							
								9:10.5300...	E#...	✓	-22.9...	-2.55...	22.8...							
								20.6...	-12.2...	✓	20.6...	-12.2...	-22.8...							
				Ev...	0027	11-06-2...	18:49:11.3500...	18:49:11.3500...	E#...	✓	20.6...	-12.2...	-22.8...							
				Ev...	0028	11-06-2...	18:49:12.2800...	18:49:12.2800...	E#...	✓	2.0200	-21.6...	19.2...	0.001	-3...	×	×	0	0	10
				Ev...	0029	11-06-2...	18:49:14.1000...	18:49:14.1000...	E#...	✓	18.1...	16.0...	-24.9...	0.001	-3...	×	×	0	0	10
				Ev...	0030	11-06-2...	18:49:14.3200...	18:49:14.3200...	E#...	✓	21.4...	-1.98...	-23.7...	0.001	-3...	×	×	0	0	11
				Ev...	0031	11-06-2...	18:49:15.0800...	18:49:15.0800...	E#...	✓	-1.96...	-22.5...	21.8...	0.001	-2...	×	×	0	0	13
				Ev...	0032	11-06-2...	18:49:16.3500...	18:49:16.3500...	E#...	✓	9.4300	16.1...	23.7...	0.001	-3...	×	×	0	0	10
				Ev...	0033	11-06-2...	18:49:17.2800...	18:49:17.2800...	E#...	✓	20.5...	-9.69...	-21.5...	0.001	-3...	×	×	0	0	11
				Ev...	0034	11-06-2...	18:49:17.6100...	18:49:17.6100...	E#...	✓	20.8...	-10.9...	22.3...	0.001	-3...	×	×	0	0	10
				Ev...	0035	11-06-2...	18:49:17.8900...	18:49:17.8900...	E#...	✓	15.3...	2.0000	21.0...	0.001	-3...	×	×	0	0	11
				Ev...	0036	11-06-2...	18:49:18.3200...	18:49:18.3200...	E#...	✓	-21.7...	23.3...	24.9...	0.001	-2...	×	×	0	0	10

The InSite Global Button Bar allows you to switch between the available visualisers.

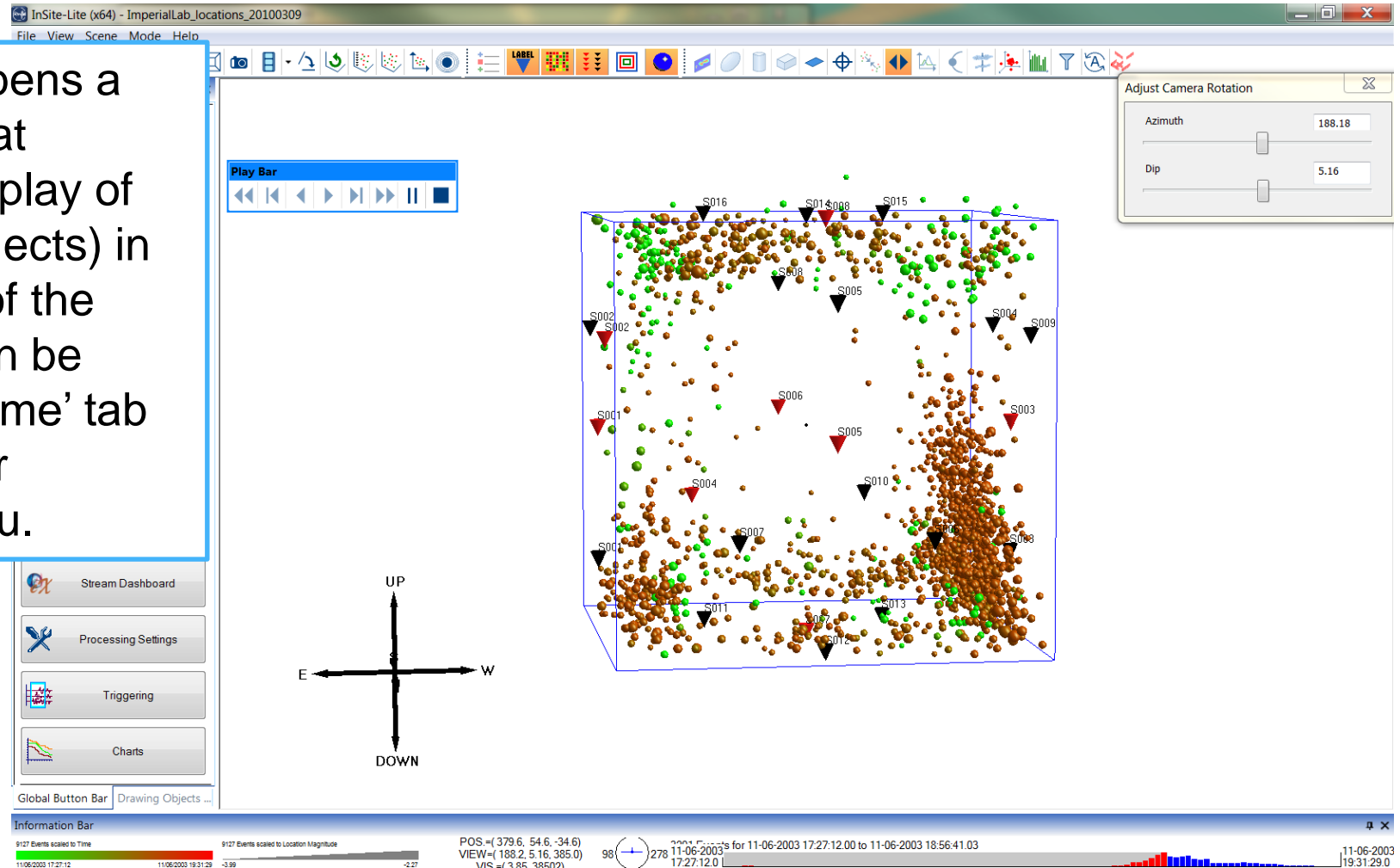
Try going to the 3D Visualiser.

InSite's default view is the 'Data Visualiser', showing a catalogue of all Seismic/MS/AE events imported or processed within the project

3D Visualiser includes an outline of the rock sample, AE sensors and all located events scaled to time and location magnitude.

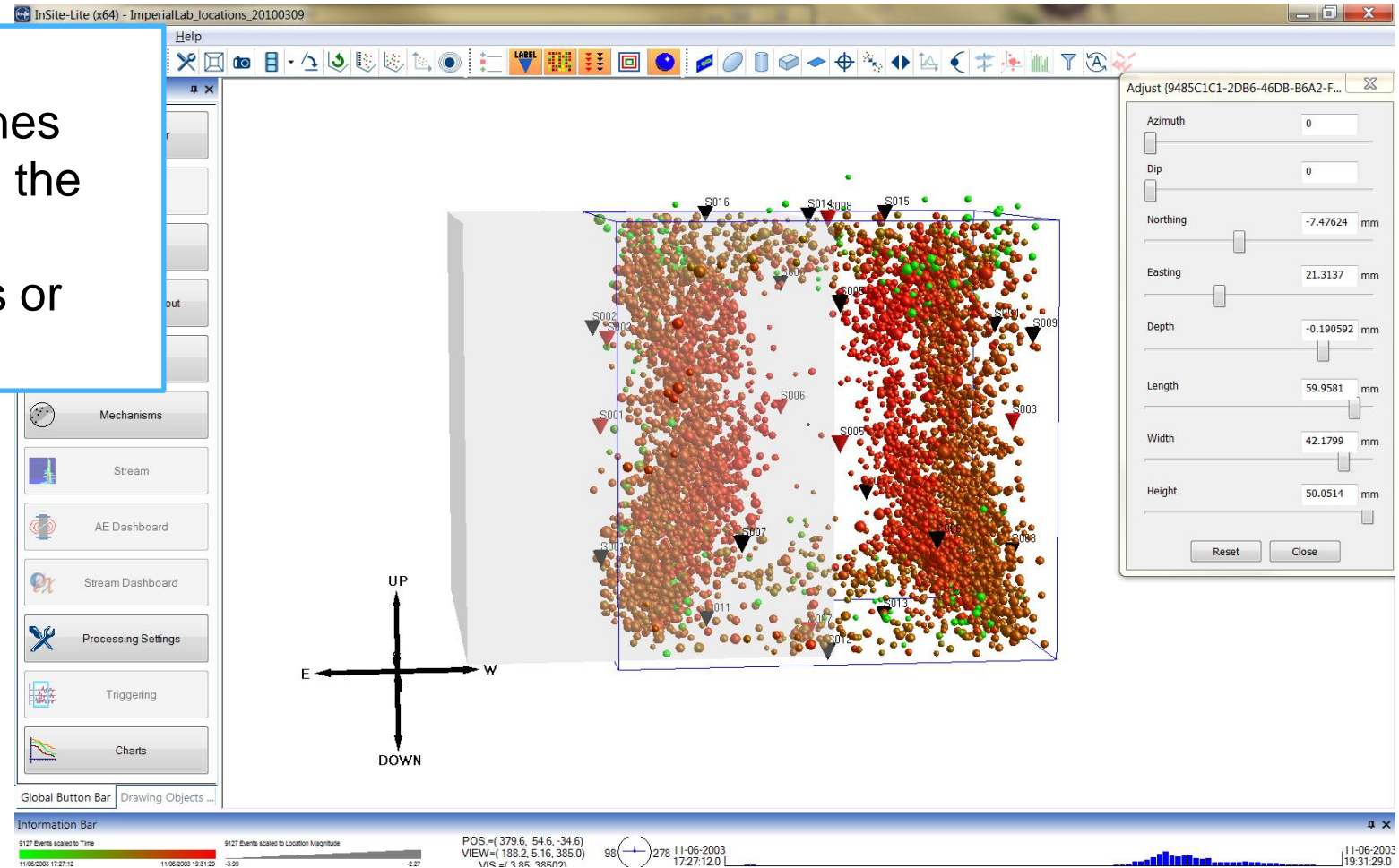


‘Play events’ opens a video player that controls the display of events (and objects) in time. Settings of the time display can be edited in the ‘Time’ tab of the visualiser properties menu.





Cuboid, ellipsoid, cylinders and planes can be inserted in the scene to highlight observed features or filtering events





Event Filter Dialog

Filter the events by any of the parameters specified below. Only enabled components are filtered. Events are enabled/disabled depending on whether they fit the criteria. By default, events outside the specified criteria are disabled. By selecting 'Invert' on each option, events inside the specified criteria are disabled.

Date and Time

☐ Date and Time

☐ Invert Filter

Minimum  
hour : min : secs 0 : 0 : 0  
day - month - year 1 - 1 - 100

Maximum  
hour : min : secs 0 : 0 : 0  
day - month - year 1 - 1 - 3000

Parameters

☐ Inst.Magnitude Minimum = 0 Maximum = 5 ☐ Invert Filter

☐ Loc.Magnitude Minimum = 0 Maximum = 5 ☐ Invert Filter

☐ Mom.Magnitude Minimum = 0 Maximum = 5 ☐ Invert Filter

☐ Location Error Minimum = 0 Maximum = 1 ☐ Invert Filter

☐ Independent Instruments Minimum = 5 ☐ Invert Filter

☐ Cluster Index Minimum = 1 ☐ Invert Filter

☐ Interacting Neighbours Minimum = 1 ☐ Invert Filter

☐ P Picks Minimum = 5 ☐ Invert Filter

☐ S Picks Minimum = 5 ☐ Invert Filter

☐ Angular Residual Minimum = 0 Maximum = 30 ☐ Invert Filter

☐ Source Vectors Minimum = 0 Maximum = 5 ☐ Invert Filter

☐ Confidence number Minimum = 2 ☐ Invert Filter

☐ P-wave SNR Minimum = 1 ☐ Invert Filter

☐ S-wave SNR Minimum = 1 ☐ Invert Filter

Volume

☐ Location Volume

☐ Invert Filter

Minimum  
(N, E, D) = ( -100 , -100 , -100 )

Maximum  
(N, E, D) = ( 100 , 100 , 100 )

☐ DOF Volume

☒ Inside Volume

Outside Position  
(N, E, D) = ( 0 , 0 , 0 )

☐ Outside Volume

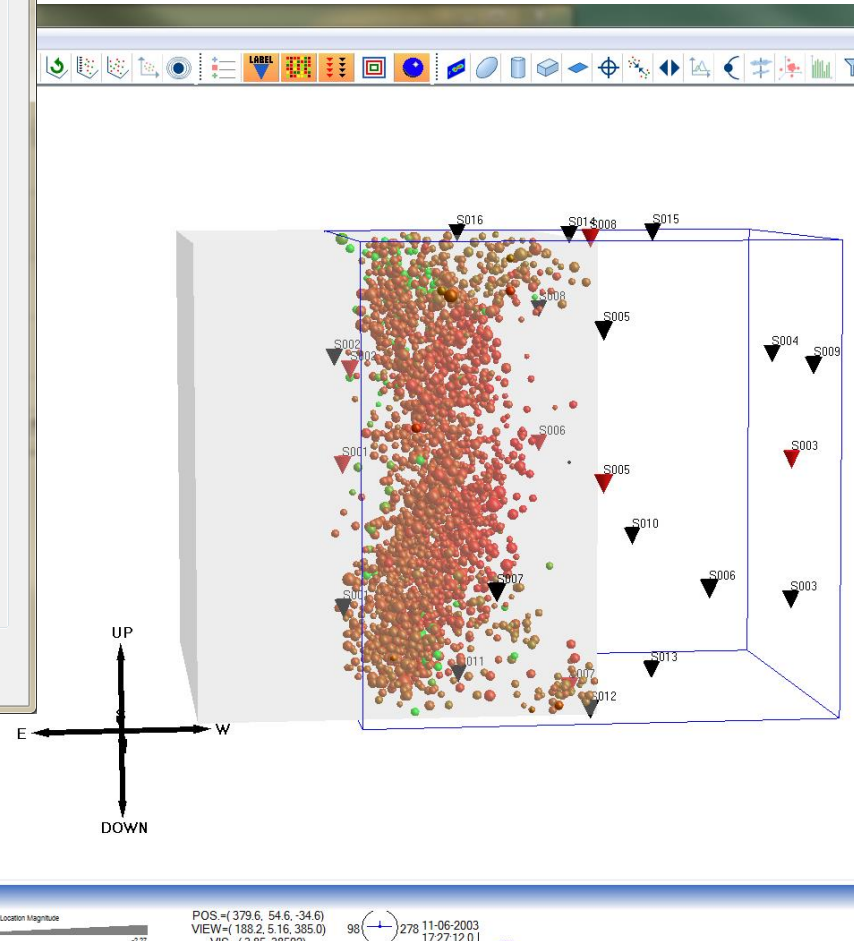
3D Visualiser Objects

☐ Ellipsoid ☐ Cylinder ☒ Cuboid

☐ Invert ☐ Invert ☐ Invert

Found 3617 Events.

Filter Close



Event filter disables or enables events using a range of parameters, time or space, including drawing objects. This examples shows filtering of events inside the inserted cuboid