

Tracer/TileCAL

TileCal Week Computing 18 Feb 2022

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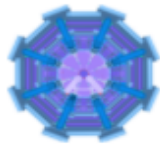
Georgian Technical University

INTRODUCTION



ATLAS Tracer

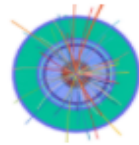
3-Dimensional Framework for the Visualization of the ATLAS Detector



TracerCORE

Core module of the 3-Dimensional Visualization of the ATLAS detector

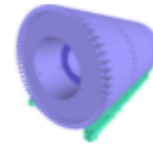
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TracerEVD

3-Dimensional Event Display Application

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TracerTCAL

3-Dimensional Interactive Display of the Tile Calorimeter

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TracerART

Augmented Reality Table enables to put detector on the discussion table

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TracerAR-BOOK

Augmented Reality Book is the 3D-extension of the paper printed documents

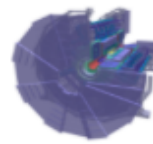
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TracerVR

Virtual Reality application for the realistic representation of the digital content of Detector in the 3D

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TracerQuickATLAS

Quick Visualization of the ATLAS detector

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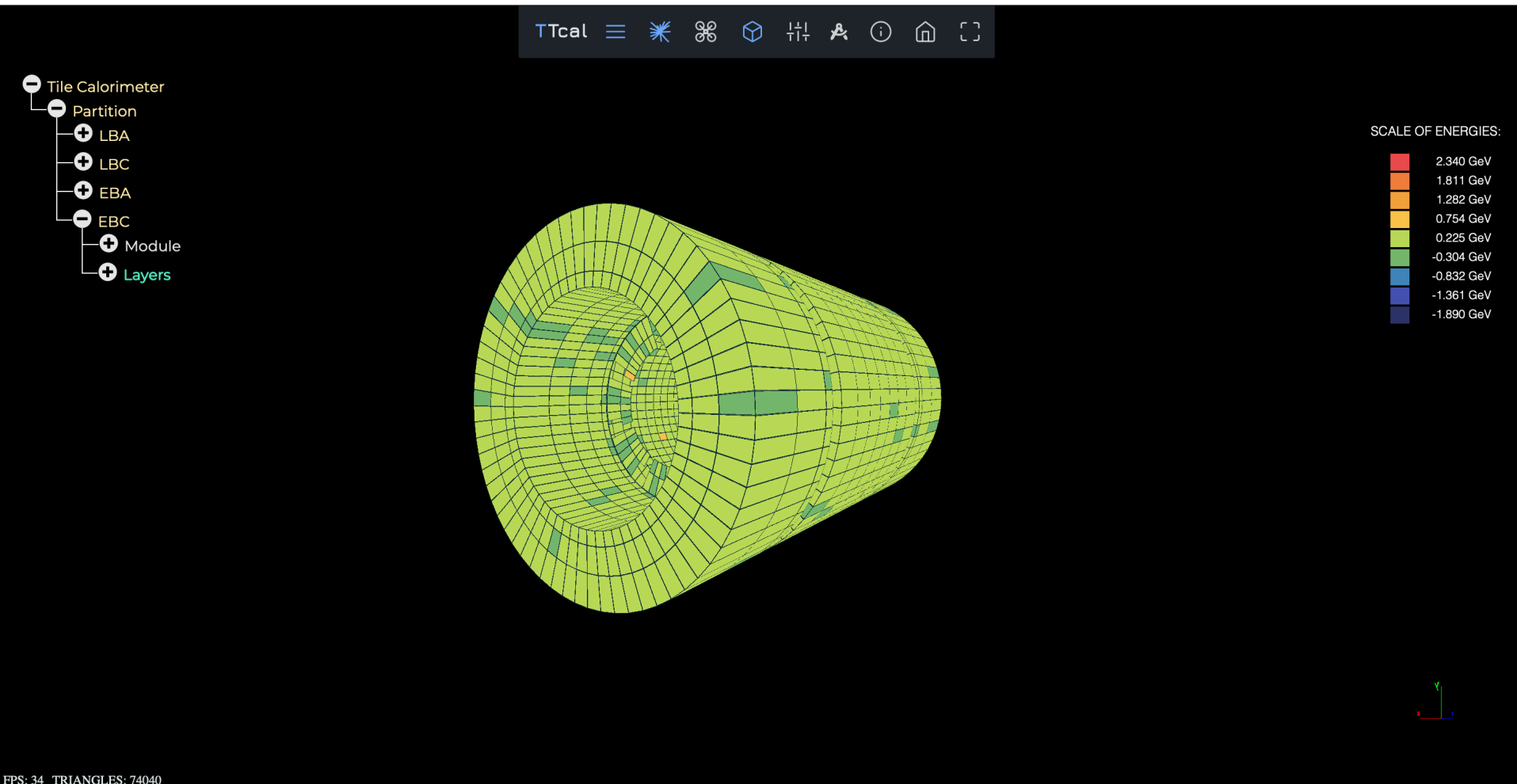


TracerARD





Augmented Reality Door for the navigation inside of the ATLAS detector

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New User Interface



TileCal Working Plan part 1

1	Visualise Channels (PMT) 
2	Display Calibration Constants per Channel (1 cell = 2 Channels) 
3	Visualise C1, C2, C3 constants values per Channel by colour and control values by smooth transaction of colours. Then if somewhere smooth transaction is broken, it will be visible that constant value is wrong and something wrong is happening in corresponding channel 
4	Possibility to select constant for visualisation 
5	Visualise changed values of constants (or RMS) in time <i>In progress</i>
6	Visualise other conditions as well, ex. noisy per cells. <i>In progress</i>
7	Display dE/dX by cells and verify of uniformity (sameness values with other cells). If not then Calibration Constants are wrong in the cell. dE/dX values will be provided by separate file. <i>In progress</i>
8	dE/dX file will be on server with possibility to update by superUser. Also application should work on local file as well, from users PC.
9	Instead of dE/dX visualise other parameters in same way. Data will come again from separate file from server or local PC

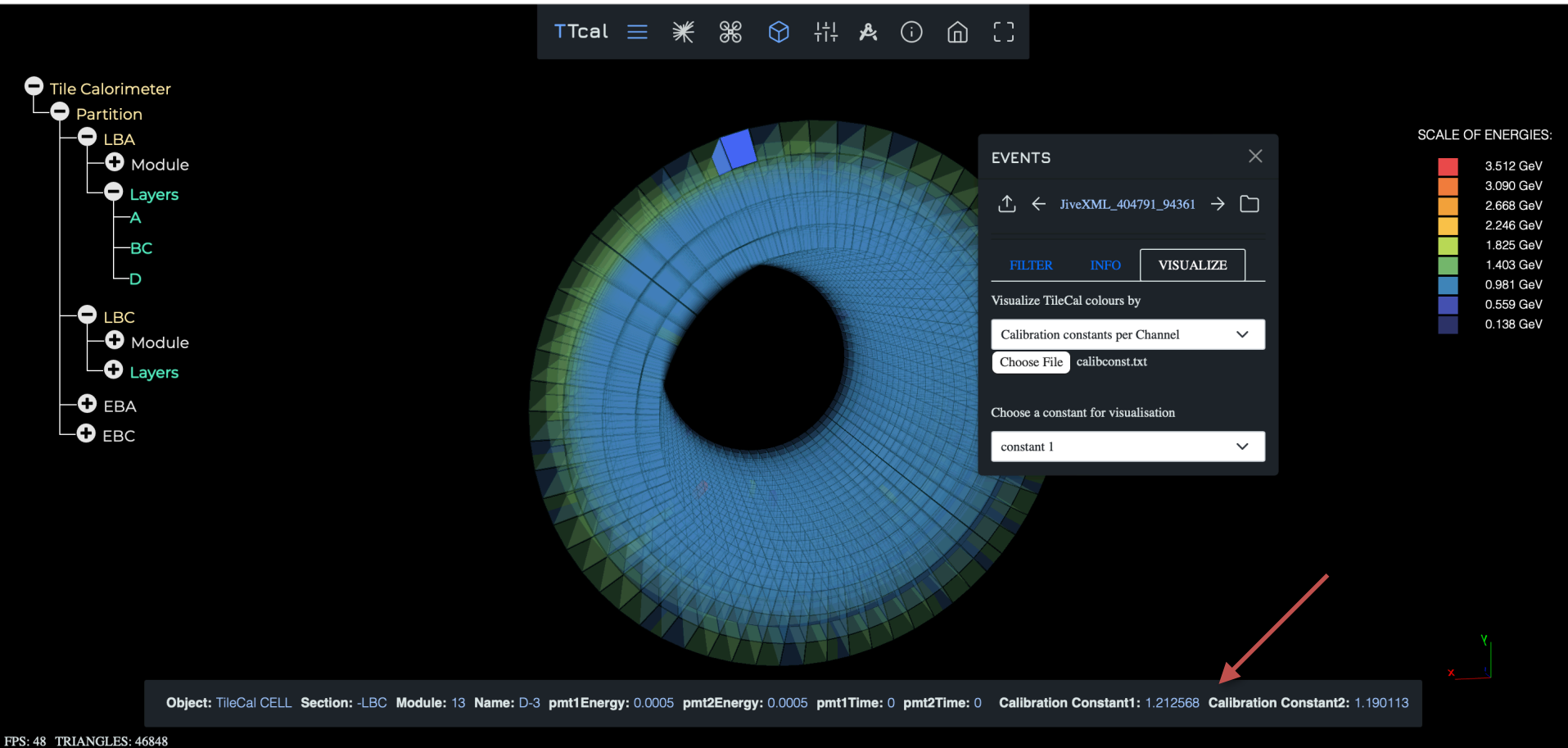
Visualise Channels (PMT)

The screenshot displays the TTcal software interface. At the top, a toolbar contains the text 'TTcal' followed by several icons: a hamburger menu, a starburst icon, a scissors icon, a cube icon, a plus-minus icon, a person icon, an information icon, a home icon, and a full-screen icon. On the left side, a tree view shows a hierarchy: 'perimeter', 'ition', 'BA', 'Module', 'Layers' (expanded to show 'A', 'BC', 'D'), 'BC', 'Module', 'Layers', 'EBA', and 'EBC'. On the right side, a vertical color scale legend is labeled 'SCALE OF' and shows a gradient from red to blue. In the center, an 'EVENTS' window is open, showing a breadcrumb path 'GROUP E 05/50' and three tabs: 'FILTER', 'INFO', and 'VISUALIZE'. The 'INFO' tab is active, displaying the following event details:

- Event E 05/50
 - Num: 1659078
 - LumiB: 65
 - RunN: 206497
 - Date: 2012-07-06
 - Time: 03:38:35

At the bottom right of the event details, it says 'Loaded Events(1)'. A small red 'x' icon is visible in the bottom right corner of the overall interface.

Display Calibration Constants per Channel



Possibility to select constant for visualisation

The screenshot displays the TileCal visualization interface. On the left, a tree view shows the hierarchy: Tile Calorimeter (expanded) -> Partition (expanded) -> LBA (expanded) -> Module (expanded) -> Layers (expanded) -> A, BC, D. Below this, LBC (expanded) -> Module (expanded) -> Layers (expanded) is shown, followed by EBA and EBC. The central 3D model shows a cylindrical structure with a central hole, colored according to energy scale. The right panel, titled 'EVENTS', shows the file 'JiveXML_404791_94361' and a 'VISUALIZE' button. Below it, a dropdown menu is set to 'Calibration constants per Channel' with a 'Choose File' button next to 'calibconst.txt'. A 'Choose a constant for visualisation' dropdown is open, showing a list of constants from 1 to 7, with 'constant 1' selected. A red arrow points to 'constant 1'. To the right of the control panel is a 'SCALE OF ENERGIES' legend with a color scale from 0.138 GeV (dark blue) to 3.512 GeV (red).

Tile Calorimeter

- Partition
 - LBA
 - Module
 - Layers
 - A
 - BC
 - D
 - LBC
 - Module
 - Layers
 - EBA
 - EBC

EVENTS

JiveXML_404791_94361

FILTER INFO VISUALIZE

Visualize TileCal colours by

Calibration constants per Channel

Choose File calibconst.txt



Choose a constant for visualisation

- ✓ constant 1
- constant 2
- constant 3
- constant 4
- constant 5
- constant 6
- constant 7

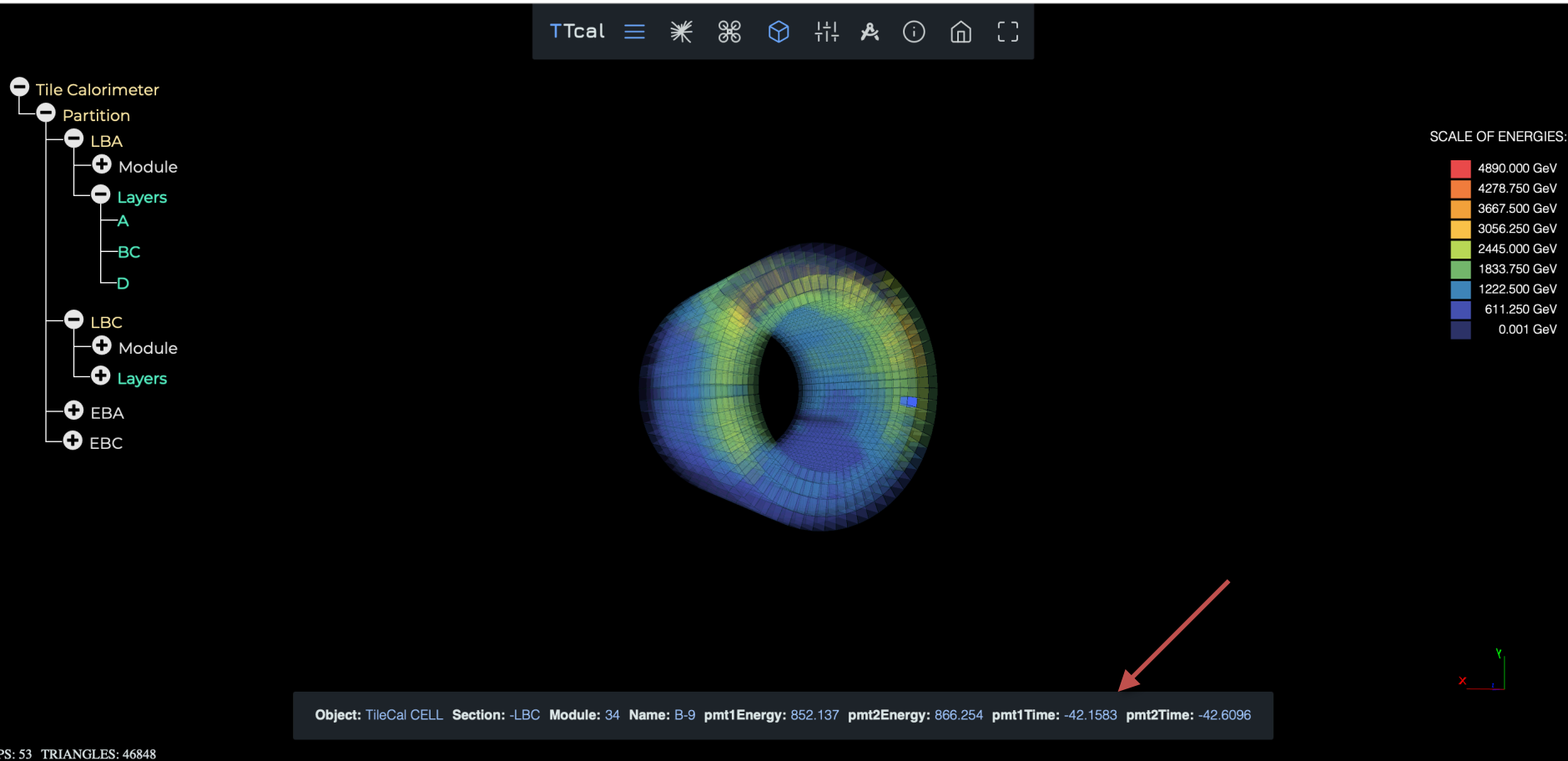
SCALE OF ENERGIES:

- 3.512 GeV
- 3.090 GeV
- 2.668 GeV
- 2.246 GeV
- 1.825 GeV
- 1.403 GeV
- 0.981 GeV
- 0.559 GeV
- 0.138 GeV

TileCal Working Plan part 2

1		Display what : Energy, Time or Energy+Time 
2	?	Connectivity with COOL DB for reading C1, C2, C3 constants by IOV's
3		Development Release 5 1. Display everything in 1:1 scale and also in deformed scale to make visible all detector components in full scale, (for instance, visualize muon system and Inner detector with different scales like in Atlantis)
4		Start application from pre-sets (links): with pre-defined event+geometry+camera position+zooming, etc. Similar to Atlantis <i>In progress</i>
5	?	Display energy deposit in cells by same colour but different square size inside the cell <i>In progress</i>
6	?	Display energy deposit in cells by radiuses on plane – sum of layers (numerical values as auxiliary information)
7	?	Display energy deposit in cells alongside the eta
8		Creation of standard cuts for cells representation (1/2, 3/4, etc.); make cuts by the used controlled plane 
9	?	Display cells together with TileCal subsystems (sections) (example: on hover)

Display what : Energy, Time or Energy+Time



Creation of standard cuts for cells representation

The screenshot displays the Tcal visualization interface. On the left, a tree view shows the hierarchy: Tile Calorimeter (expanded), Partition (expanded), LBA (expanded), LBC (expanded), EBA (expanded), Module (expanded), Layers (expanded), EBC (expanded), Module (expanded), and Layers (expanded). The main view shows a 3D model of the calorimeter cells, colored according to energy. A dialog box titled 'FILTER BY ANGLE' is open, showing 'Filter by Theta: 0 - 6.3' and 'Filter by Phi: 0 - 6.3' with sliders. On the right, a 'SCALE OF ENERGIES' legend shows a color gradient from red (2.340 GeV) to blue (-1.890 GeV). The bottom left corner shows 'FPS: 30 TRIANGLES: 74040'.

Tcal

Tile Calorimeter

- Partition
 - LBA
 - LBC
 - EBA
 - Module
 - Layers
 - EBC
 - Module
 - Layers

SCALE OF ENERGIES:


- 2.340 GeV
- 1.811 GeV
- 1.282 GeV
- 0.754 GeV
- 0.225 GeV
- 0.304 GeV
- 0.832 GeV
- 1.361 GeV
- 1.890 GeV

FILTER BY ANGLE

Filter by Theta: 0 - 6.3

Filter by Phi: 0 - 6.3

FPS: 30 TRIANGLES: 74040

10	Check the visualised geometry with Tile experts
11	Energy scheme should adjust properties of cells/channels when loading new event, but during filtering with energy, energy scheme should not change. 
12	Add tool to change energy scheme max/min values. <i>In progress</i>
13	Change discrete energy scheme with continuous gradient scheme. (Or add switch for user to choose between types of scheme). <i>In progress</i>
14	Change info window of selected cell into two row window filled with first and second PMT property values correspondingly .
15	Add selecting gain when loading calibration constants info file.

Thanks for your
Attention!

Comments are Welcome

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