Visualization of TileCal by WebGI api

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Georgian Technical University (GTU)

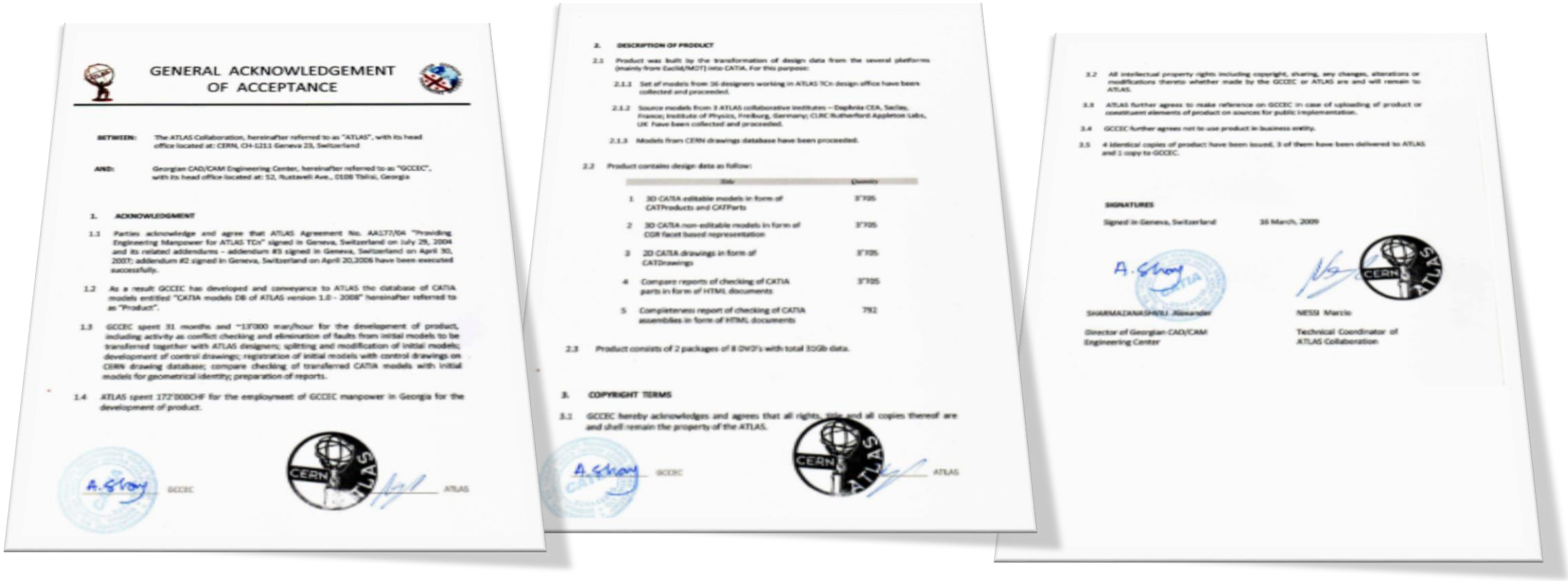
Nuclear Engineering Center (NEC)

ABOUT NEC

- Collaboration with ATLAS since 2004
- Done 7 Collaboration Agreements
- Done 27 Working Packages
- 2004-2008 work with ATLAS TCn
- 2009-2018 work with ATLAS Software & Computing

Projects Highlight

Project Title: **Development of Geometry Descriptions of ATLAS Detector**



GENERAL ACKNOWLEDGEMENT OF ACCEPTANCE

BETWEEN: The ATLAS Collaboration, hereinafter referred to as "ATLAS", with its head office located at: CERN, CH-1211 Geneva 23, Switzerland

AND: Georgian CAD/CAM Engineering Center, hereinafter referred to as "GCCEC", with its head office located at: 52, Rustaveli Ave., 0108 Tbilisi, Georgia

1. ACKNOWLEDGMENT

1.1 Parties acknowledge and agree that ATLAS Agreement No. AA177/04 "Providing Engineering Manpower for ATLAS TCn" signed in Geneva, Switzerland on July 29, 2004 and its related addendums – addendum #3 signed in Geneva, Switzerland on April 30, 2007; addendum #2 signed in Geneva, Switzerland on April 20,2006 have been executed successfully.

1.2 As a result GCCEC has developed and conveyance to ATLAS the database of CATIA models entitled "CATIA models DB of ATLAS version 1.0 - 2008" hereinafter referred to as "Product".

1.3 GCCEC spent 31 months and "137000 man/hour for the development of product, including activity as conflict checking and elimination of faults from initial models to be transferred together with ATLAS designers; splitting and modification of initial models; development of control drawings; registration of initial models with control drawings on CERN drawing database; compare checking of transferred CATIA models with initial models for geometrical identity; preparation of reports.

1.4 ATLAS spent 172'000CHF for the employment of GCCEC manpower in Georgia for the development of product.

A. Shar — GCCEC

CERN ATLAS — ATLAS

2. DESCRIPTION OF PRODUCT

2.1 Product was built by the transformation of design data from the several platforms (mainly from Euclid/MOT) into CATIA. For this purpose:

2.1.1 Set of models from 16 designers working in ATLAS TCn design office have been collected and proceeded.

2.1.2 Source models from 3 ATLAS collaborative institutes – Dapnia CEA, Saclay, France; Institute of Physics, Freiburg, Germany; CLRC Rutherford Appleton Labs, UK have been collected and proceeded.

2.1.3 Models from CERN drawings database have been proceeded.

2.2 Product contains design data as follow:

1	3D CATIA editable models in form of CATProducts and CATParts	3'705
2	3D CATIA non-editable models in form of CGR facet based representation	3'705
3	2D CATIA drawings in form of CATDrawings	3'705
4	Compare reports of checking of CATIA parts in form of HTML documents	3'705
5	Completeness report of checking of CATIA assemblies in form of HTML documents	792

2.3 Product consists of 2 packages of 8 DVD's with total 31Gb data.

3. COPYRIGHT TERMS

3.1 GCCEC hereby acknowledges and agrees that all rights, title and all copies thereof are and shall remain the property of the ATLAS.

A. Shar — GCCEC

CERN ATLAS — ATLAS

3.2 All intellectual property rights including copyright, sharing, any changes, alterations or modifications thereto whether made by the GCCEC or ATLAS are and will remain to ATLAS.

3.3 ATLAS further agrees to make reference on GCCEC in case of uploading of product or constituent elements of product on sources for public implementation.

3.4 GCCEC further agrees not to use product in business entity.

3.5 4 identical copies of product have been issued, 3 of them have been delivered to ATLAS and 1 copy to GCCEC.

SIGNATURES

Signed in Geneva, Switzerland — 16 March, 2009

A. Shar

SHARMAZANASHVILI Alexander

Director of Georgian CAD/CAM Engineering Center

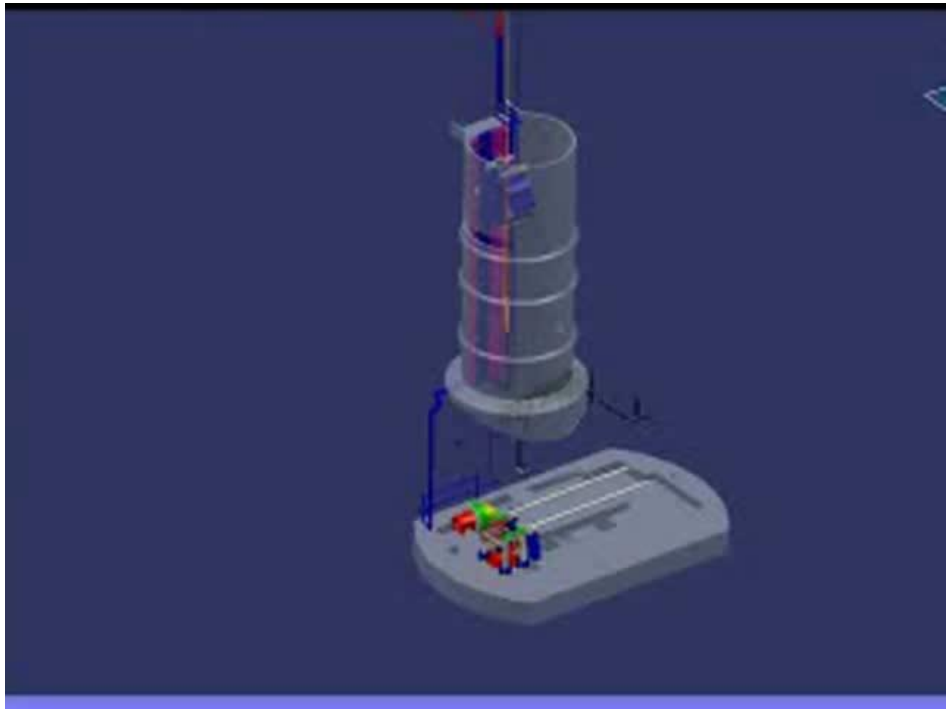
CERN ATLAS

NESSI Marzio

Technical Coordinator of ATLAS Collaboration

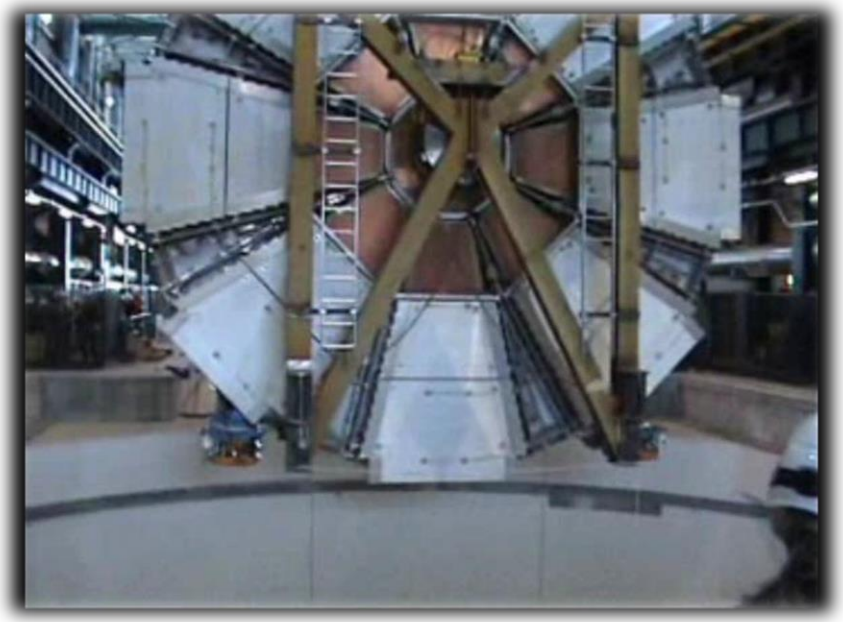
Projects Highlight

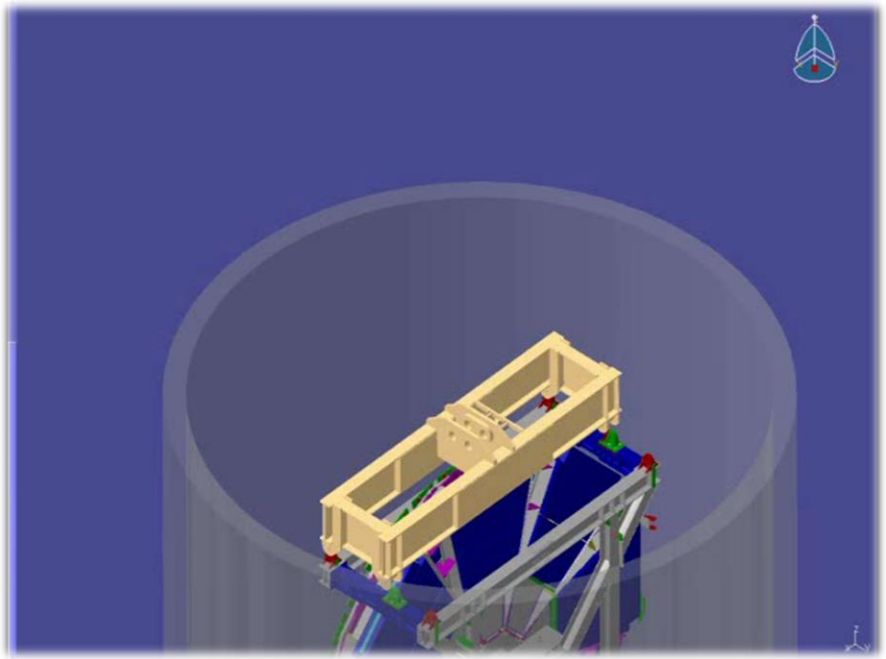
Project Title: **End CAP Toroid Installation Side A / Side C**



Projects Highlight

Project Title: **NSW Installation Side A / Side C**

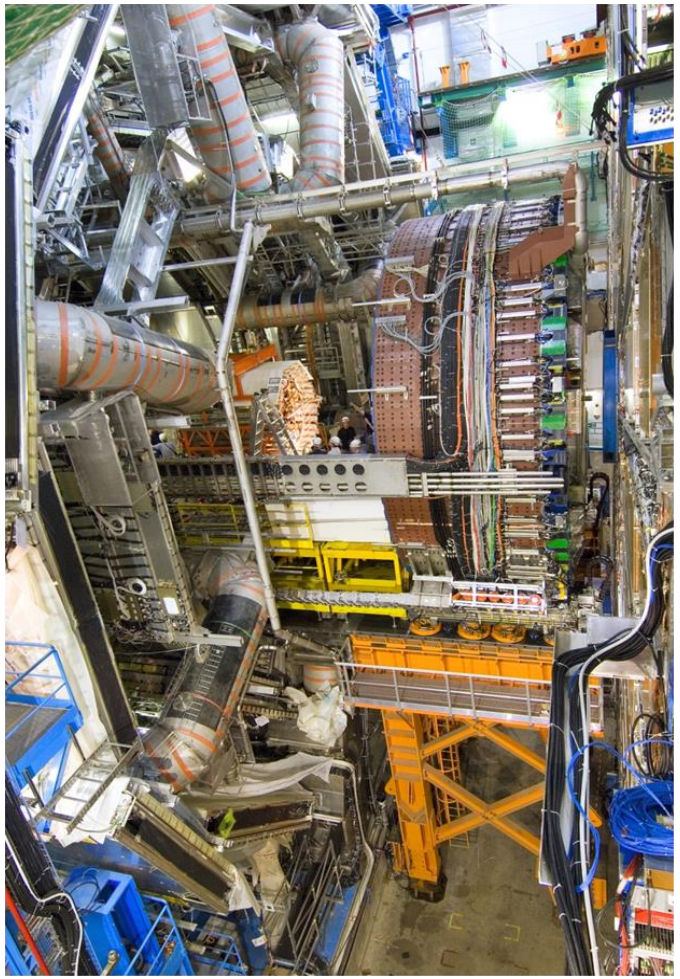


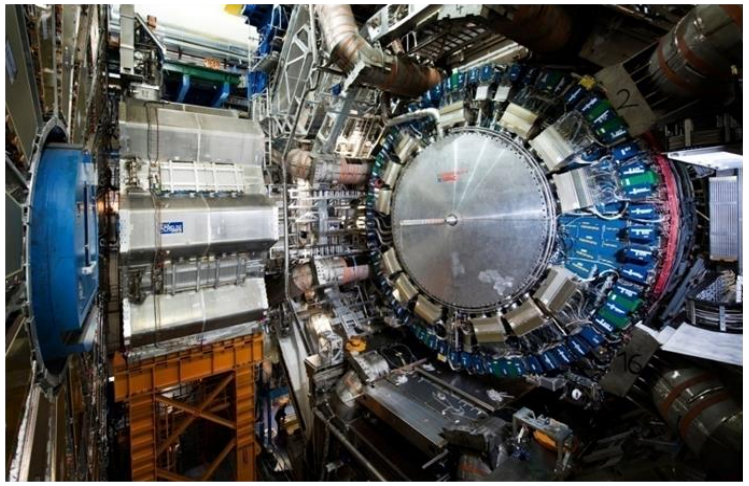


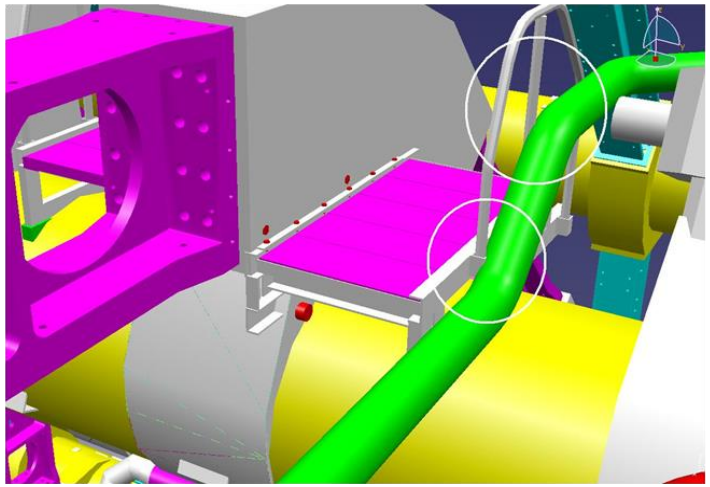
Projects Highlight

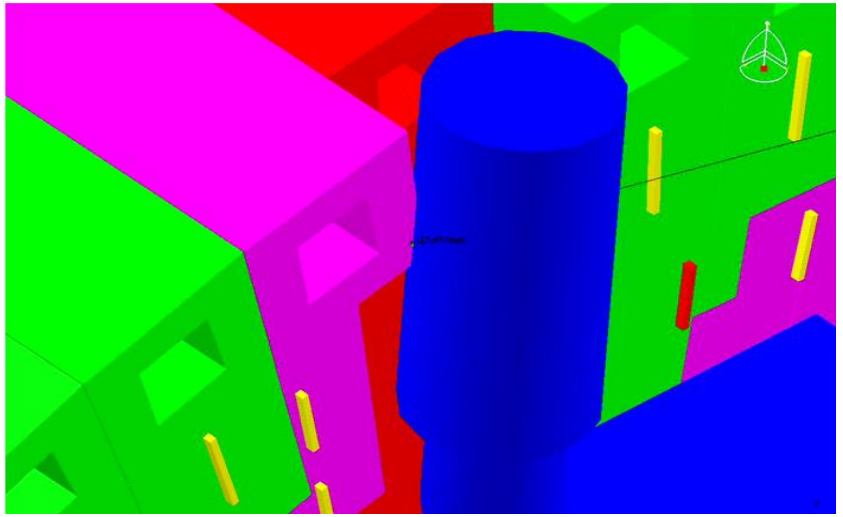
Project Title: **Integration Conflicts Checking**

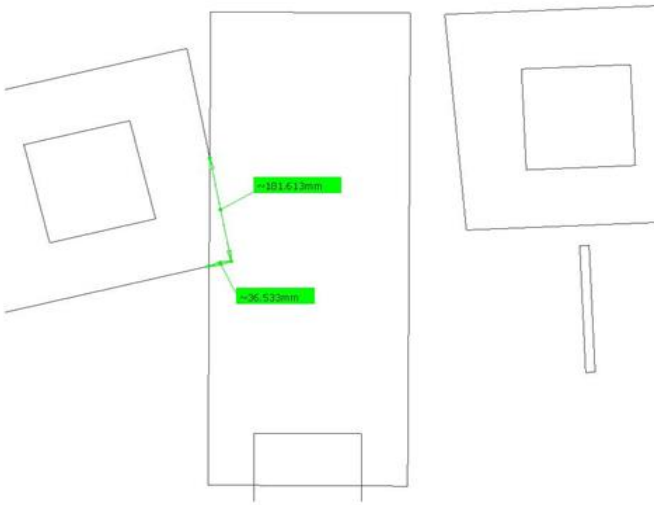
Person in charge: Nikolai Topilin







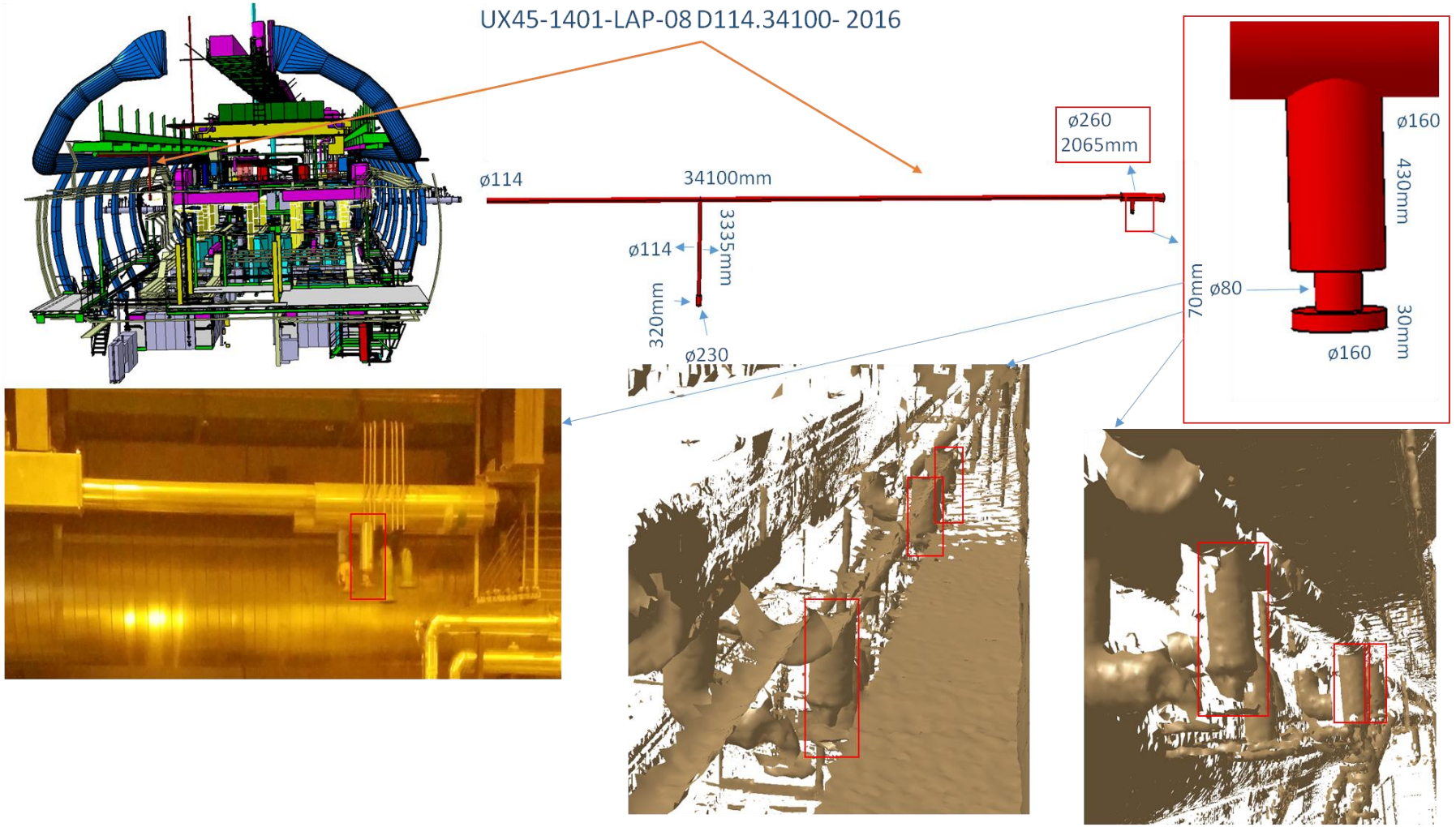




- 400 Assemblies checked, 700 technical reports prepared

Projects Highlight

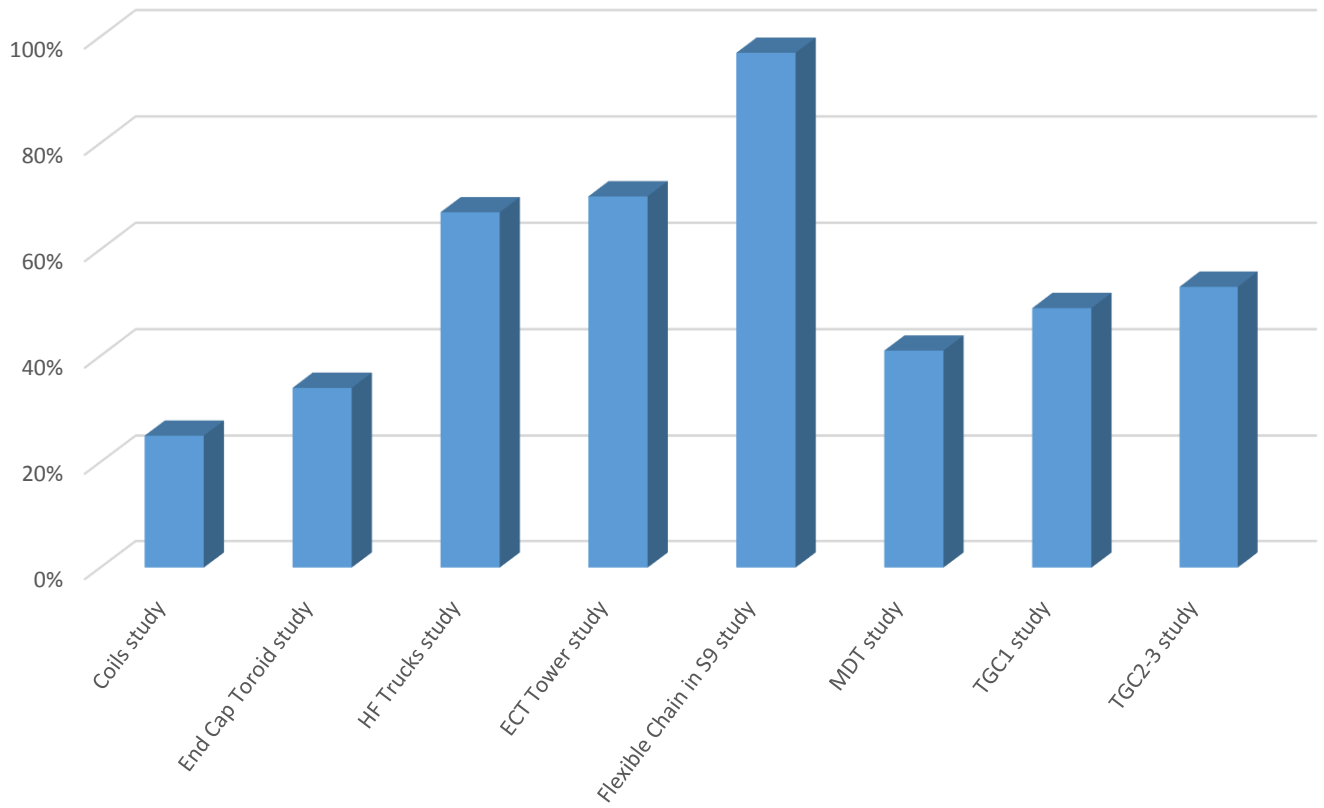
Project Title: **Recovering 3D models from laser scan images**



Projects Highlight

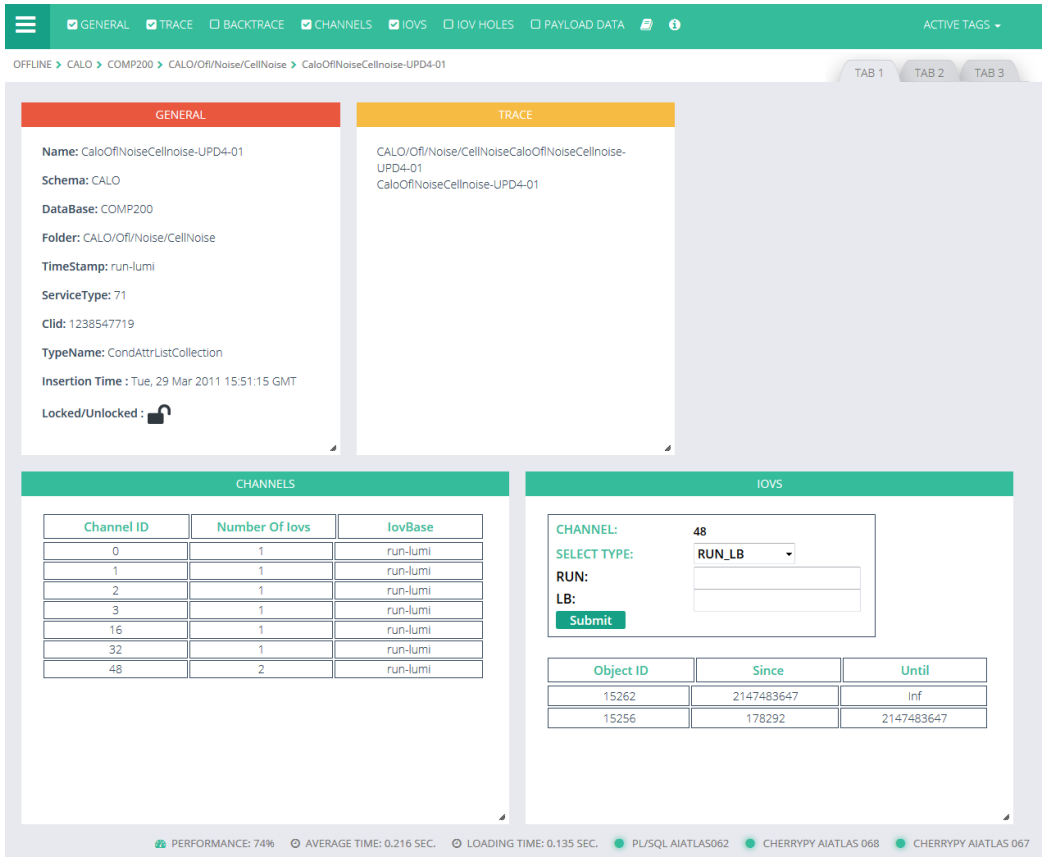
Project Title: **CATIA vs Geant-4 Compare Analyses of Geometry Descriptions of Detector**

	Project	Difference
1	Coils study	25%
2	End Cap Toroid study	34%
3	HF Trucks study	67%
4	ECT Tower study	70%
5	Flexible Chain in S9 study	97%
6	MDT study	41%
7	TGC1 study	49%
8	TGC2-3 study	53%



Projects Highlight

Project Title: **Development of COOL Tag Browser**

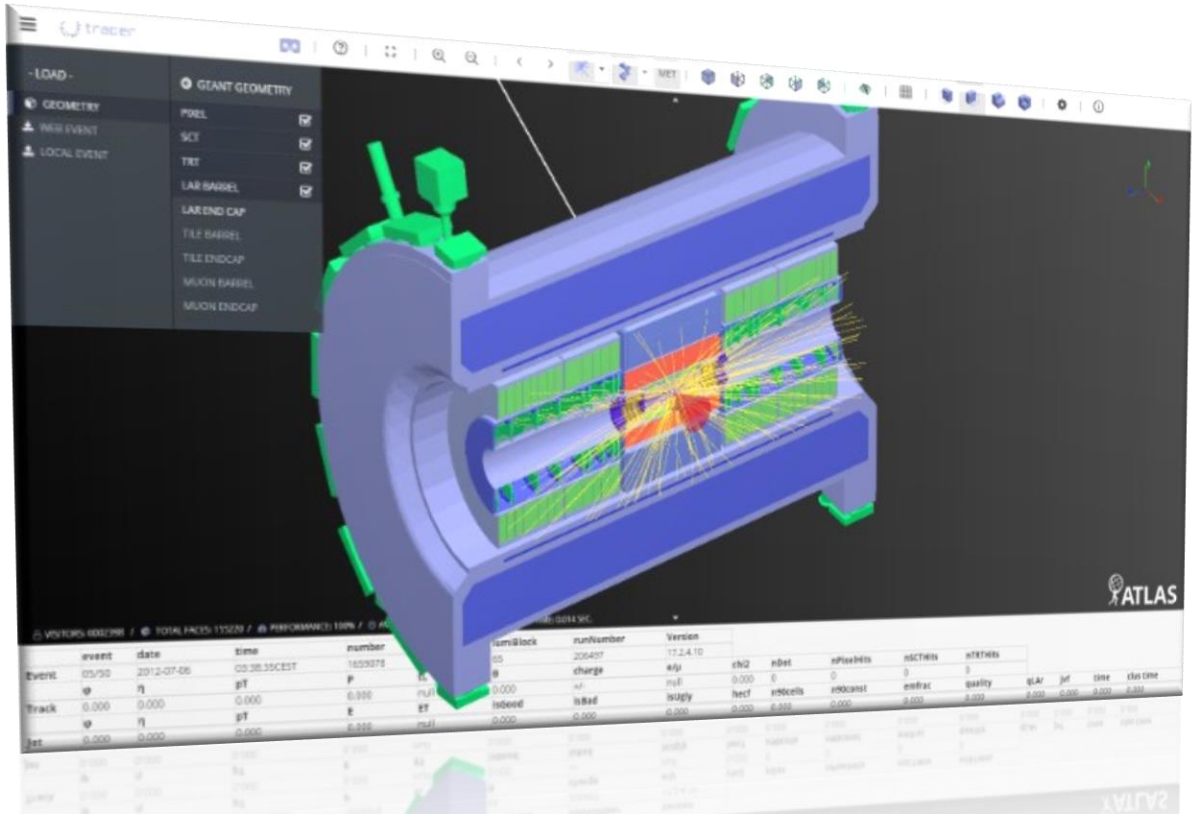


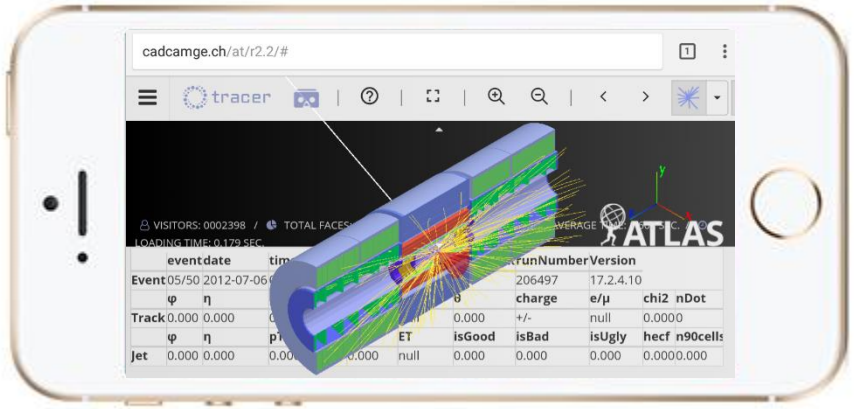
https://atlas-coolbrowser.web.cern.ch/atlas-coolbrowser/

Projects Highlight

Project Title: **Development of Interactive Detector Display – ATLAS Tracer**

- Visualization of Components
- Visualization of events



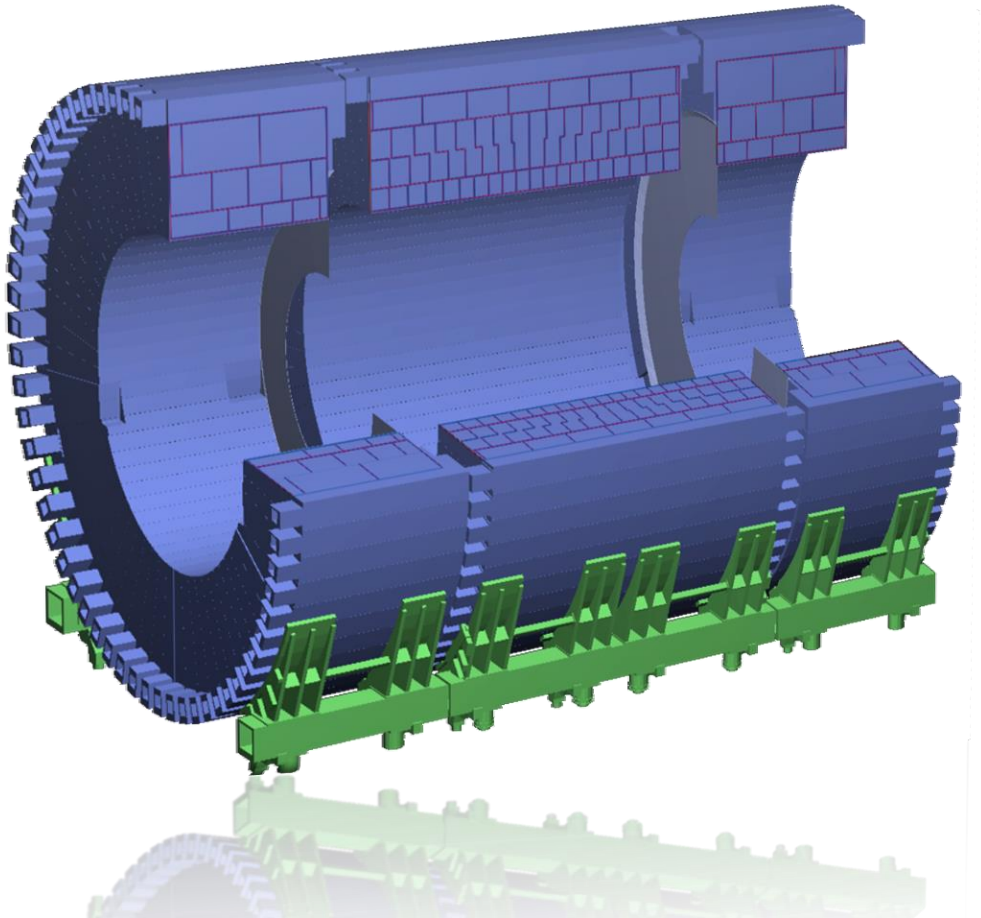


http://tracer.web.cern.ch

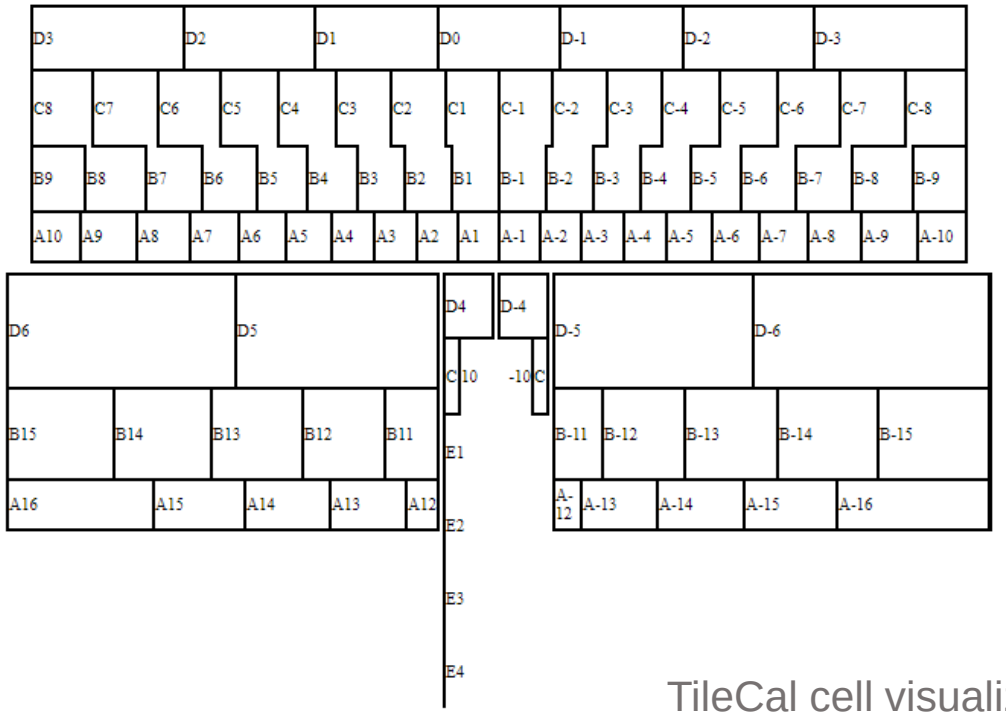
Generic Project for Tile Calorimeter

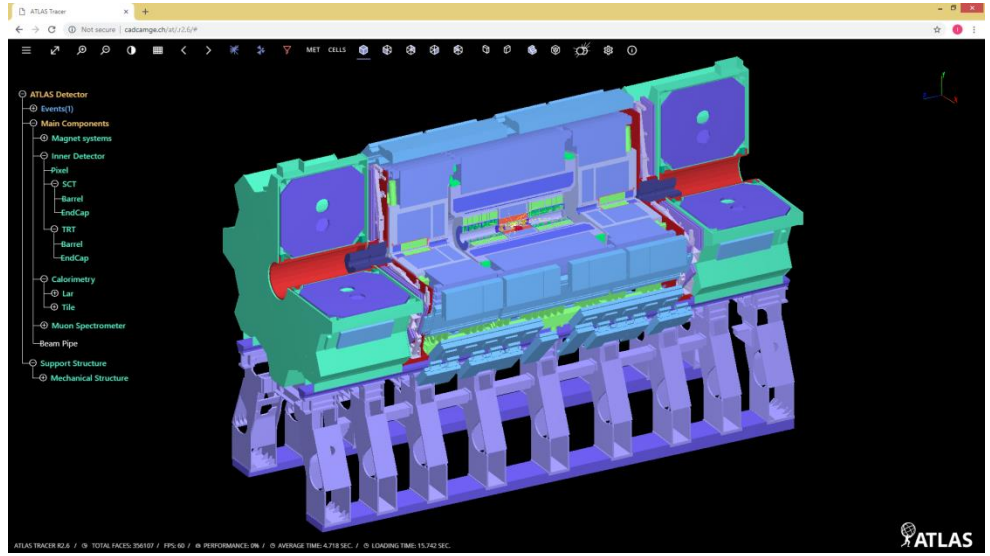
Project Title: **Development of Software Application for Visualization of Tile Calorimeter**

- We are using WebGL open source
- Hardware / Software platform independent
- No installation is needed
- First interest was expressed by Oleg
- Thanks Sanya for assistance



First stage of development





TileCal cell visualization using WebGL API

Application Input

```
<?xml version="1.0"?>
<?xml-stylesheet type="text/xsl" href="JiveXML_event.xsl"?>
<?ATLAS Release: "17.2.4.10"?>
<!DOCTYPE Event SYSTEM "event.dtd">


<Event version="17.2.4.10" runNumber="206409" eventNumber="1727302" lumiBlock="213" dateTime="2012-07-04 22:13:32 UTC" eventProperty="default">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<Jet count="13" storeGateKey="AntiKt4LCTopoJets"> ··· </Jet>

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<Track count="755" storeGateKey="Tracks"> ··· </Track>
```
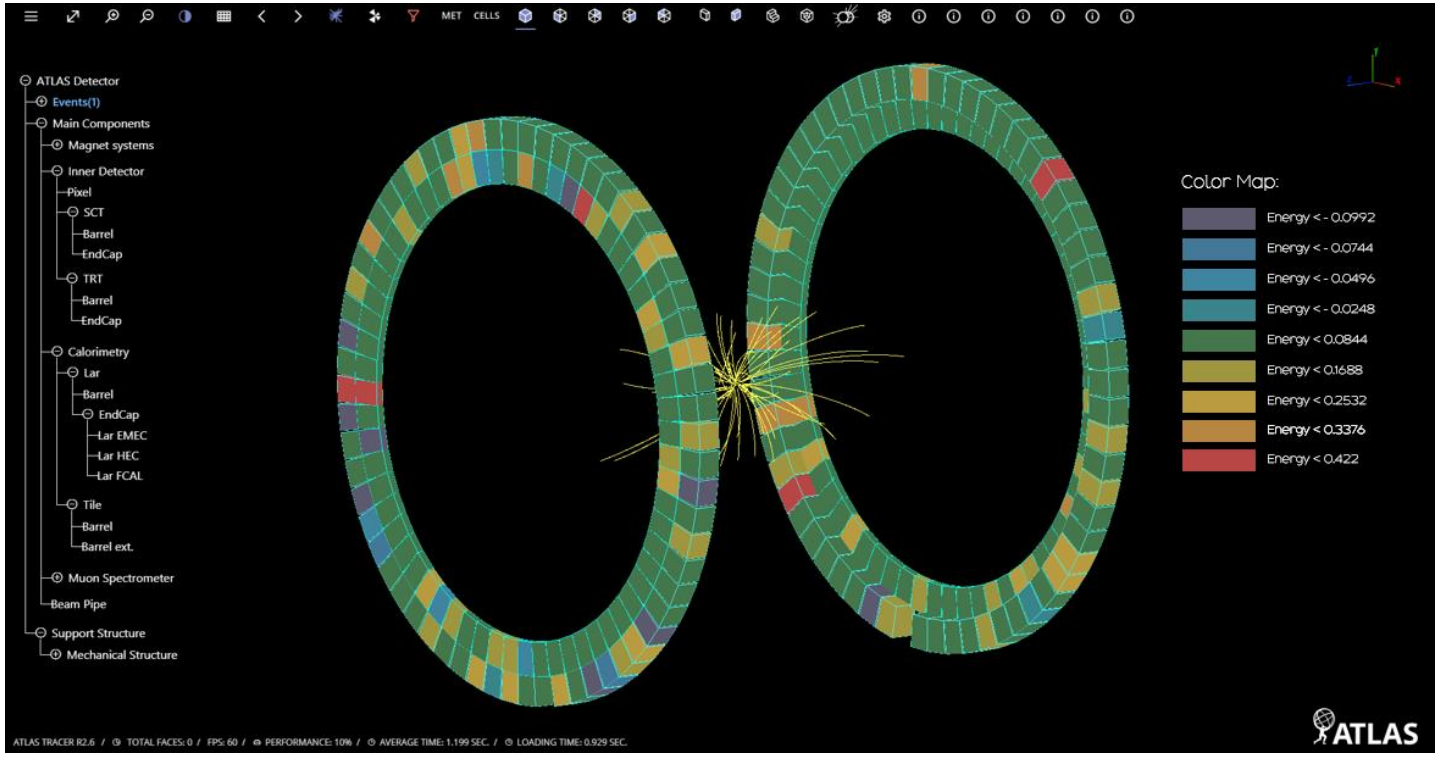

- JiveXML is an Athena package that contains algorithms to convert event Data to XML files
- Both fully reconstructed and fast simulated events can be converted to XML
- There is no documentation about its structure

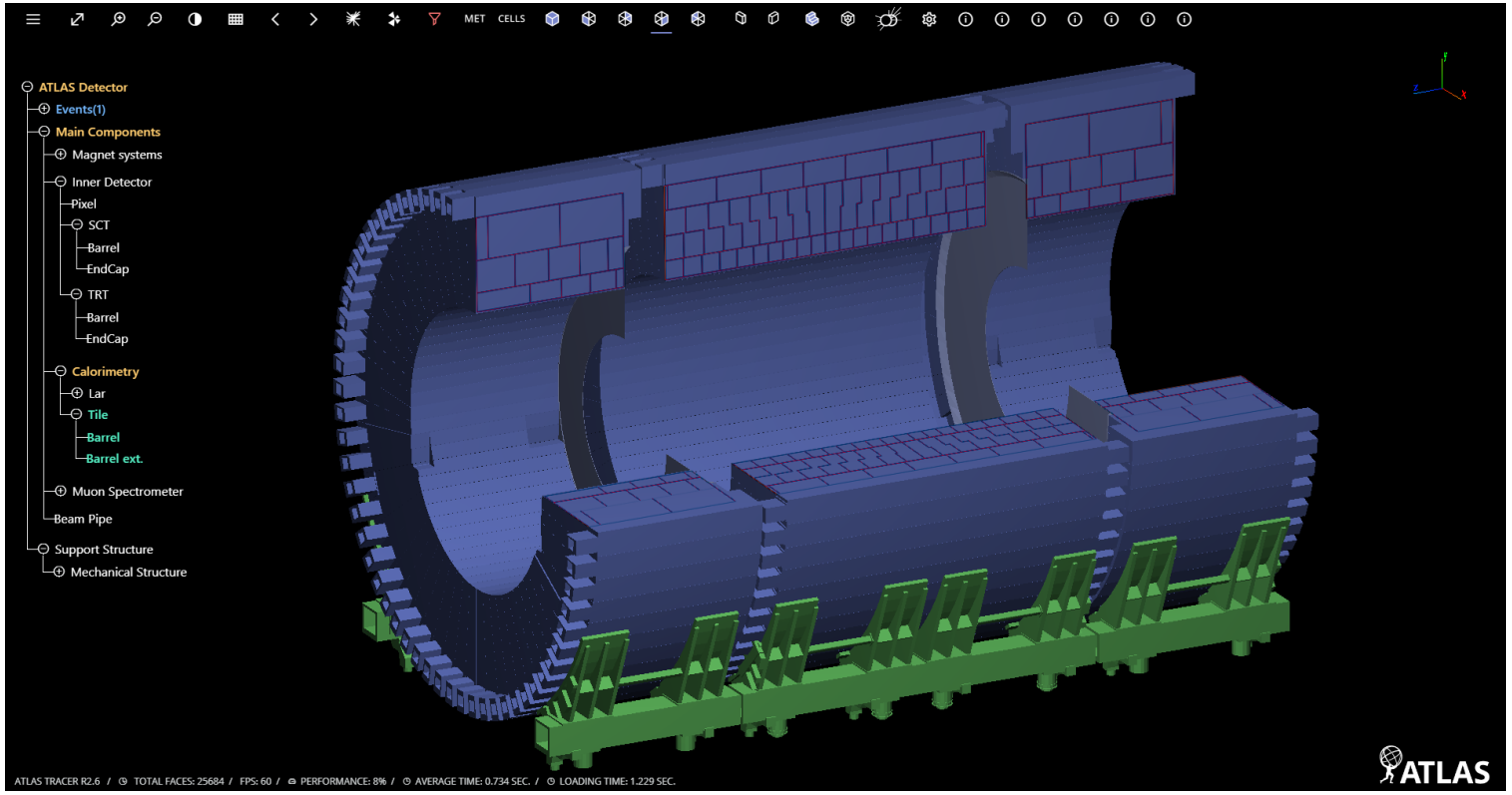
Current Version



[ATLAS Tracer R 2.6]

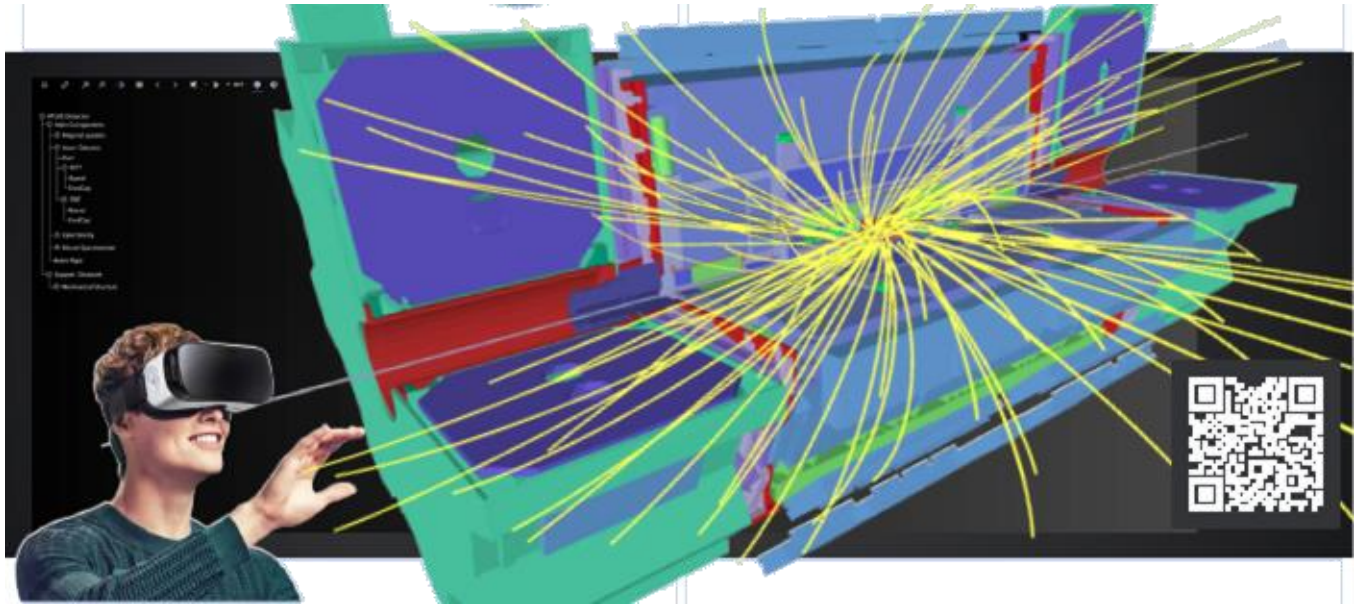
Ongoing Task

Visualization of 5146 TIleCal cells



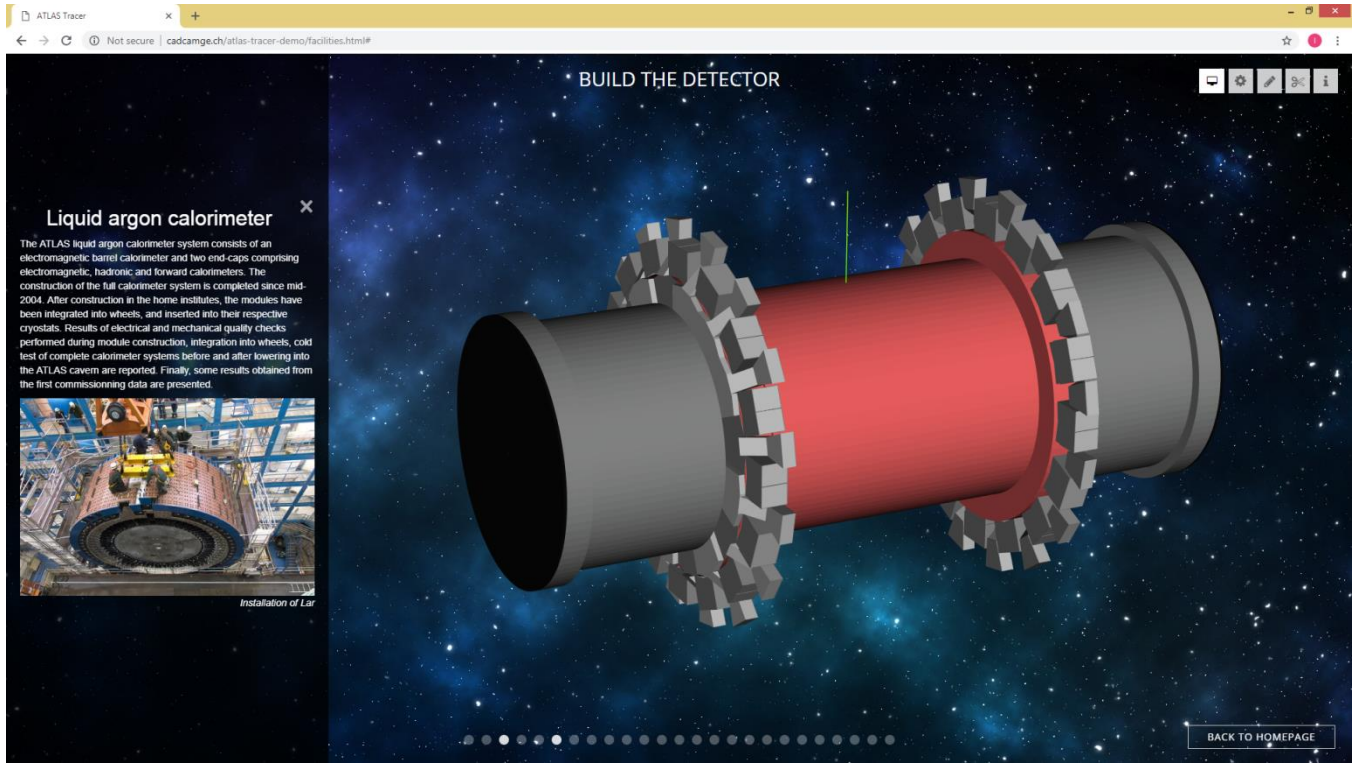
Goals

- Display cell information by clicking on them
- Filtering cells by its specifications



- Particle animation
- VR interactive tool

Development Of Cognitive Part



Flashy web page with all kind of information about TileCal

Conclusions

1. Application development have several phases
2. Visualization of energy deposits on D4/C10 has been done
3. Visualization of energy deposits on all cells will be added soon
4. We have several options for continuation
5. For the moment development process is going without any commitments
6. We would like to see formal base for our collaboration. Signed agreement will be the good solution with schedules and responsibilities

Thanks for your attention