BROWSER BASED DETECTOR DISPLAYS FOR OUTREACH & EDUCATION

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Definitions

- Detector Display (DD) is software application for learning detector facilities and physical events

Requirements Coming from Outreach & Education

- Easy accessibility
- Compatibility with hardware & software platforms
- No stresses of users platform and configuration
- Well dressed user interface and interactive scenario
- Workable on mobile devices (~70% of internet users using mobile devices)

Concept

- Best solution can be found by using of internet browsers as an working platforms for the application:

Weaknesses

- No binaries, no executables, just real time interpretation of source code -> brings performance issue and limitations of optimal usage of hardware

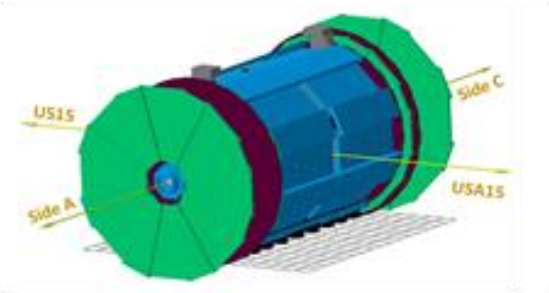
Benefits

- No installations on users side, just click_and_go
- Compatibility to all hardware platforms and OS
- Open sources

- Proposal: Implementation of WebGL/three.js graphical engine for visualization of facilities and events for Outreach & Education
  - All browsers nowadays are coming with WebGL built-in libraries
  - WebGl has sophisticated visualization features
  - Accessible through the javascript functions

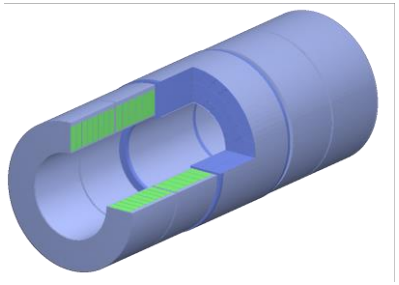
Limitations

- Representation of facilities



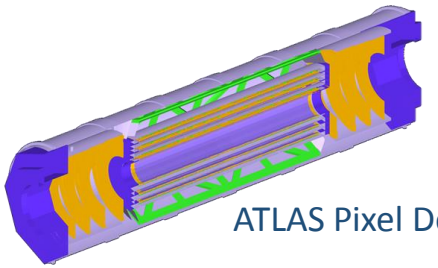
Imported *facet*-based models (*wrml, json, stl. etc)*

- If total number of facets exceed 2mln browser kills process



ATLAS TRT Detector – 708k facets

- Boolean processor is very weak for complex geometries



ATLAS Pixel Detector

- WebGL Boolean processor crashing after 18min of working
- Firefox RAM consumption is about 3.2Gb

R & D Proposal

1. Investigation of WebGL limitations and finding ways how to make agreement between them and DD application requirements
2. Development methods and tools for facilities' geometry import and simplification
3. Development methods and tools for Boolean operations for geometry cutouts
4. Solving performance issue

DD Prototype on the base of proposed platform

tracer.web.cern.ch

Thanks!