Interface to Unity for High Energy Physics detectors visualization

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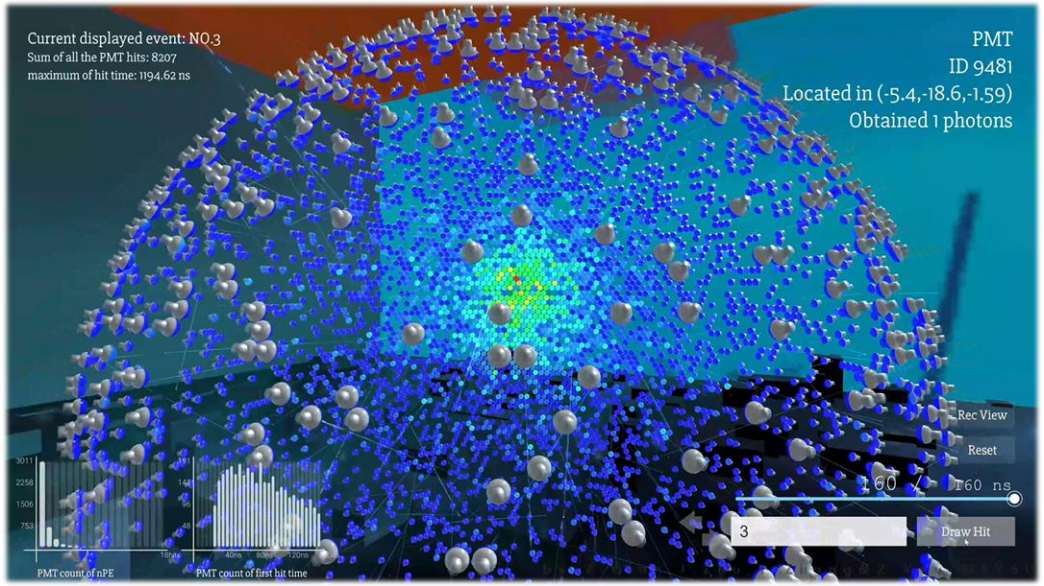
Visualization requirements

- Detector design
- Detector construction & assembly
- Detector commissioning
- Experiment operation & maintenance
- Data quality monitoring
- Simulation & reconstruction
- Event display
- Physics analysis
- Education
- Outreach



JUNO event display - ELAINA

mp-ph] 26 Nov 2018

HEP Software Foundation Community White Paper Working Group – Visualization

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Visualization Technology from Industry

- **Unity** is a professional video and game production engine, which can help to visualize HEP detectors.

generate profitable outputs such as games, movies, industrial design, etc.,

→ stable economic support, and professional investment

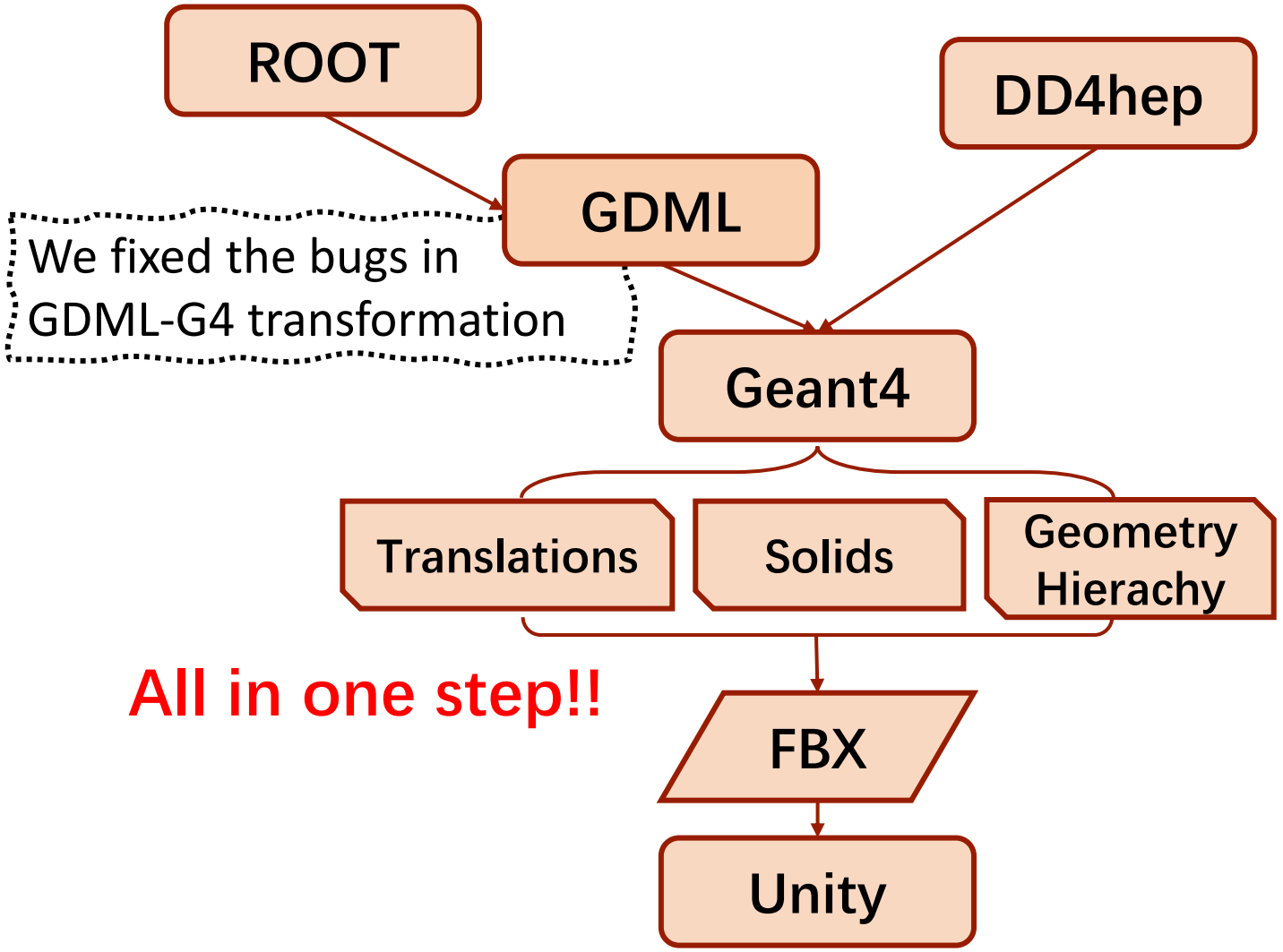
→ Advanced technology

→ the diverse needs of commercial clients

→ Software – Platform – System – Hardware seamless integration

- Professional 3D software.
- Provide access to VR or AR.
- Supports more than 20 platforms.

A new method provided by this work

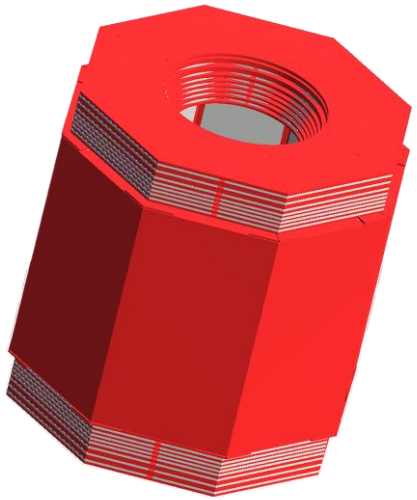


(develop based on HSF Geometry Writer)

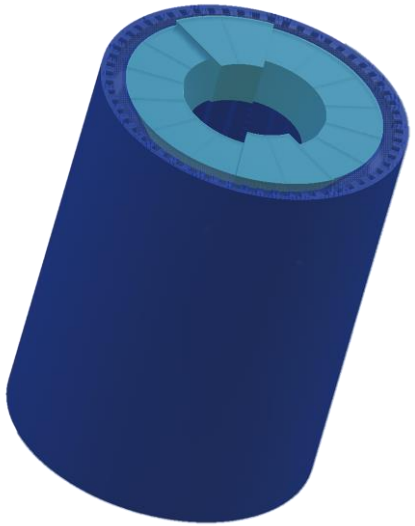
- Maintain the unique identifier.
- Support self-defined shapes and geometry classes.
- Is able to assist all four detector descriptions.

Visualization in Unity

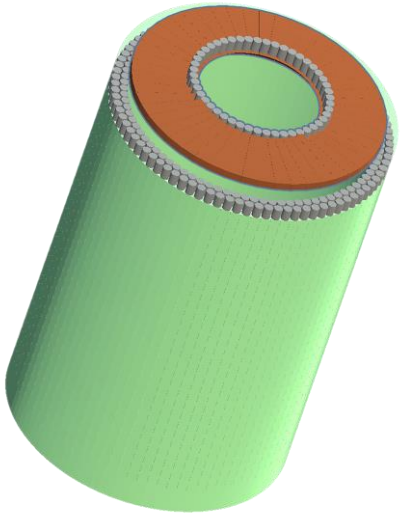
1. **GDML to Unity with BESIII detector**



MUC



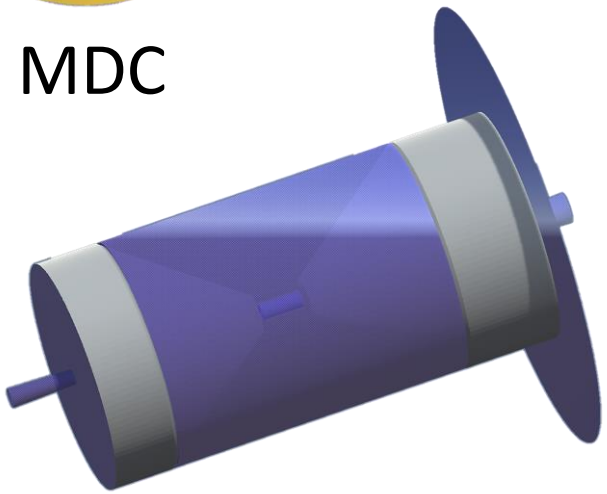
EMC



TOF

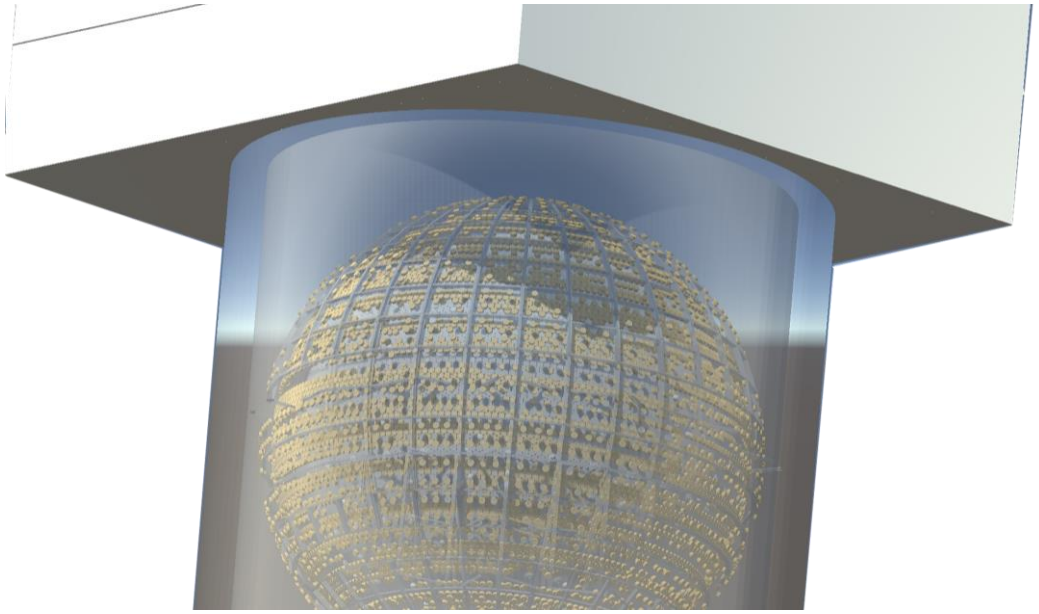
MDC

2. **ROOT to Unity with EicC detector**

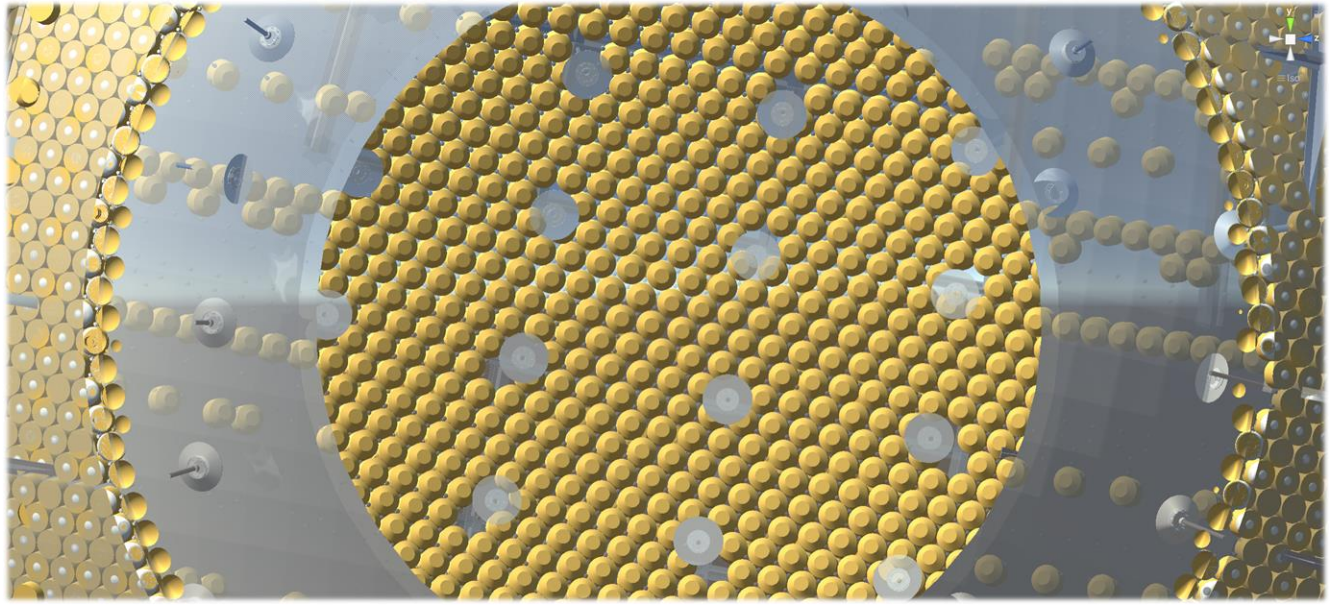


Visualization in Unity

3. Geant4 to Unity with JUNO detector



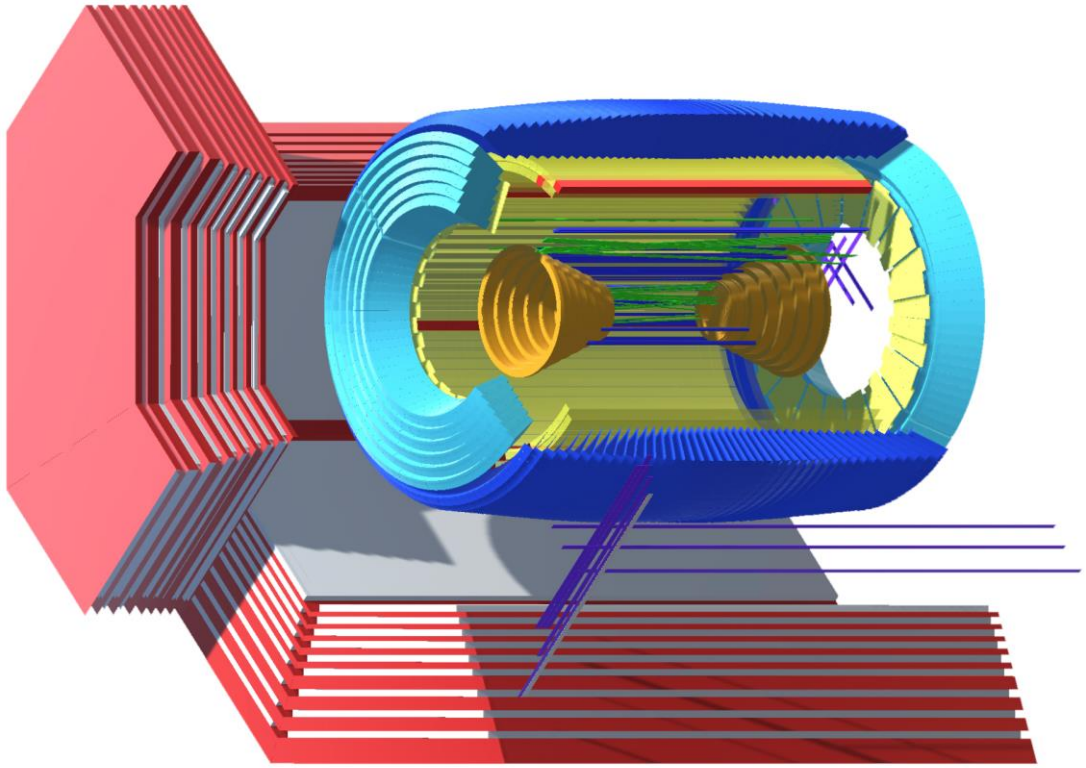
side view from outside of JUNO detector



Inner view of JUNO central detector

Further applications

- **Event display, AR / VR ……**



JUNO detector in VR

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Thank you for listening.

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