



CAD -> Geant4 Converter Update

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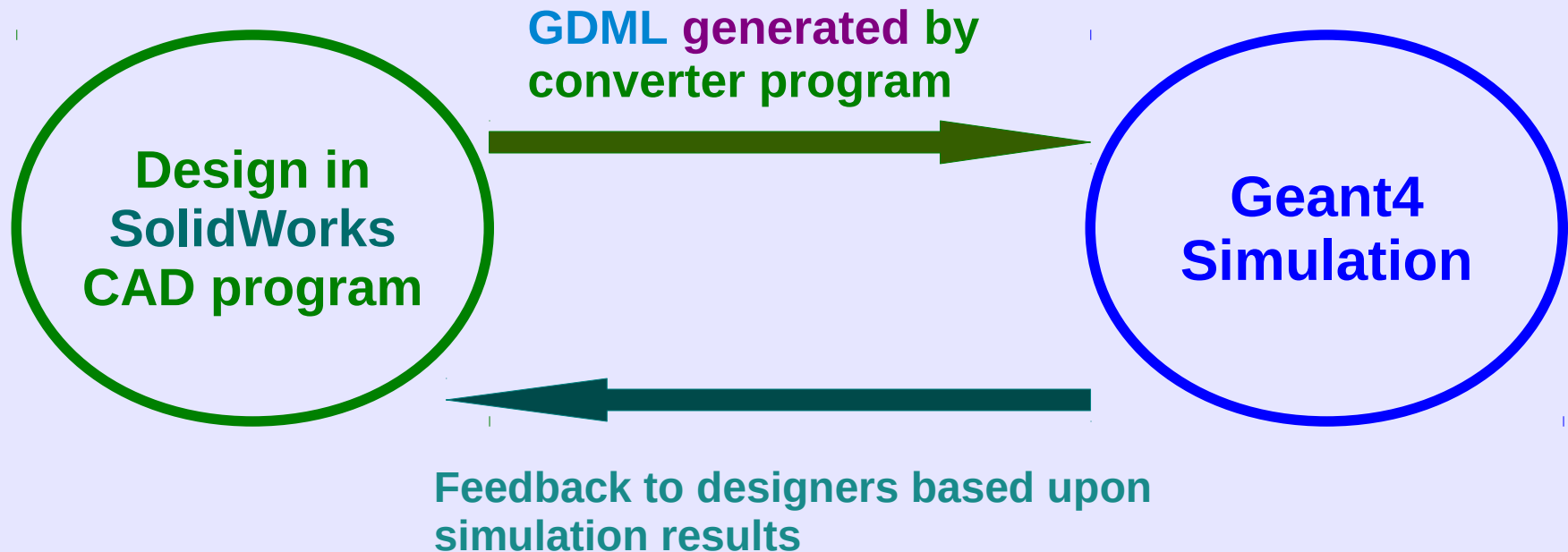
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SolidWorks -> Geant4 Converter



- Goal to have fully **automated** process of transferring design from **SolidWorks** into **Geant4**
 - Facilitate **iterative design** and simulation
 - Ensure **accuracy** of design description in Geant4





CAD-to-Geant4 Converter

- Program to automatically convert design in SolidWorks CAD program to GDML format for loading into Geant4
- C++ program developed with Visual Studio and using the SolidWorks Application Programming Interface
- About 3000 lines of code currently
- Takes one SolidWorks file and produces GDML output file
- Developed for LUX-Zeplin experiment



Features Supported



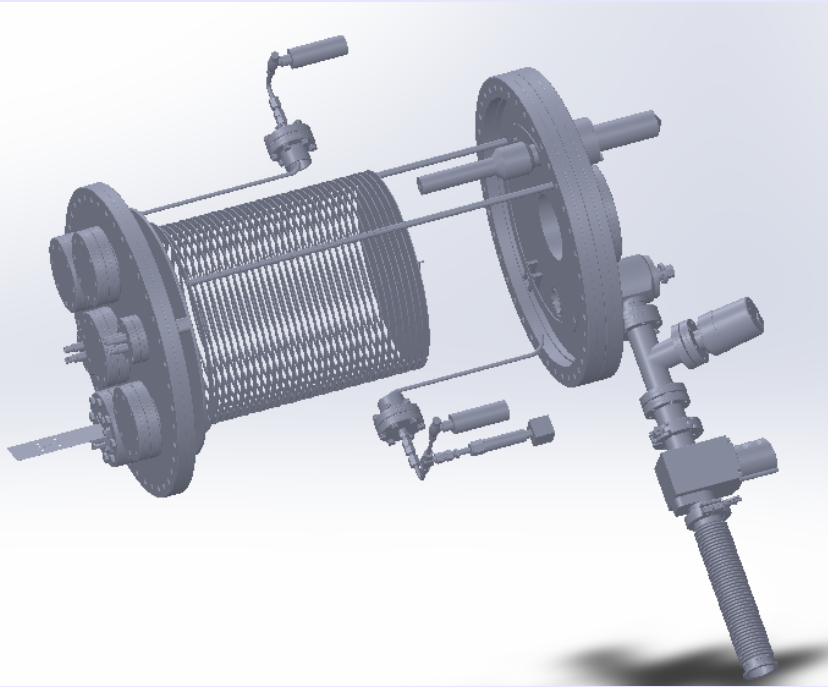
- Shapes:
 - Cylinder (full and partial)
 - Cone
 - Disk (full and partial)
 - Board
 - Torus
 - Half-ellipsoid with circular face
- Cylindrical holes in parts
- Multiple coordinate systems in simple configurations
- Repeated parts in linear patterns
- Parts assigned material properties as specified in SolidWorks



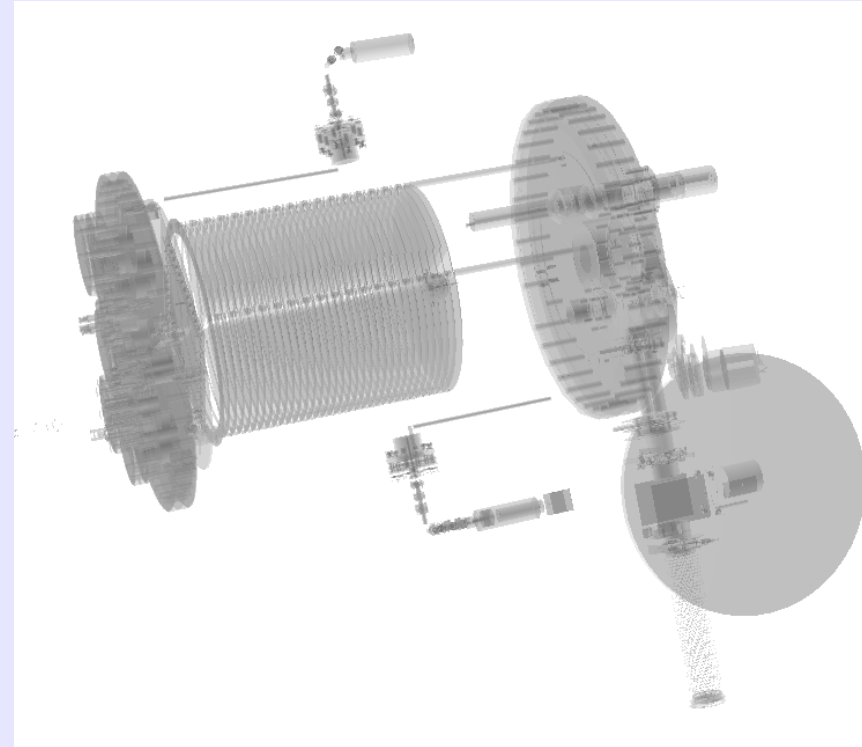
Major Milestone



SolidWorks Design



Converted to GDML



- Model of a time projection chamber
- From Panda X-III dark matter detection experiment
- Sent by Javier Galan of Shanghai Jiao Tong University
- Has nearly 4000 parts
- Still a few glitches in conversion



Next Steps



- Try converting full LUX-ZEPLIN detector model
- Continuing to work with two users
 - One from Battelle Memorial Institute working on x-ray applications for the Dept. of Homeland Security
 - Another from MD Anderson Cancer Center working on radiation oncology
 - Will prioritize requests from these users