



Contribution ID: 401

Type: **Parallel**

New software library of geometrical primitives for modelling of solids used in Monte Carlo detector simulations

Thursday, May 24, 2012 1:55 PM (25 minutes)

We present our effort for the creation of a new software library of geometrical primitives, which are used for solid modelling in Monte Carlo detector simulations. We plan to replace and unify current geometrical primitive classes in the CERN software projects Geant4 and ROOT with this library. Each solid is represented by a C++ class with methods suited for measuring distances of particles from the surface of a solid and for determination as to whether the particles are located inside, outside or on the surface of the solid. We use numerical tolerance for determining whether the particles are located on the surface. The class methods also contain basic support for visualization.

We use dedicated test suites for validation of the shape codes. These include also special performance and numerical value comparison tests for help with analysis of possible candidates of class methods as well as to verify that our new implementation proposals were designed and implemented properly.

Currently, bridge classes are used for simple integration of the library to existing versions of Geant4 and ROOT software. New versions of Geant4 and ROOT are planned to be modified in the way that our new solids library can be used there directly.

Summary

We present our effort for the creation of a new software library of geometrical primitives, which will unify current geometrical primitive classes in the CERN software projects Geant4 and ROOT. The solids are represented by C++ classes with several methods, namely those determining distance and location of the particle with relation to the surface of solids. We use several test suites for validation. A simple integration method for easy integration to the current versions of Geant4 and ROOT is proposed, that can be used in the interim period before both ROOT and GEANT4 are adapted to use our library directly.

Primary author: GAYER, Marek (CERN)

Co-authors: Mr GHEATA, Andrei (CERN); Dr COSMO, Gabriele (CERN); GUYADER, Jean-Marie (CERN); Dr APOSTOLAKIS, John (CERN); NIKITINA, Tatiana (Universite de Franche-Comte)

Presenter: GAYER, Marek (CERN)

Session Classification: Software Engineering, Data Stores and Databases

Track Classification: Software Engineering, Data Stores and Databases (track 5)