

GEANT4 and GDML detector simulation framework

Thursday 6 September 2012 15:10 (1 hour)

An accurate description of the geometry and material density in modern particle detectors becomes ever more critical as the mass of these devices decreases, and the detectors aim to be sensitive to low pt physics. An example in point is the LHCb VELO upgrade, where the pixel planes at the upgrade will be situated very close to the beam line, but separated from the primary vacuum by a thin foil with a complex corrugated shape. Understanding the shape optimization for physics performance and the expected performance has led to the development of a new software approach for simulating the material, whereby the mechanical CAD drawings can be directly imported into the GEANT4 material via a GDML (Geometry Description Markup Language) interface which converts shapes into tessellated solids made up of triangular or quadrangular facets forming a closed space. This allows a more accurate and less labour intensive geometry implementation than traditional XML approaches. First results will be shown from this method, together with the approaches taken to generalize, test, and optimize the CPU performance of the method.

Primary authors: BUYTAERT, Jan (CERN); REID, Matthew Michael (University of Warwick)

Presenter: BUYTAERT, Jan (CERN)

Session Classification: Poster session

Track Classification: Data reconstruction and algorithms - Pattern recognition and imaging