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Experience with validating GEANT4 v7 and v8 against v6 in BaBar

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BaBar Abstract #8 - Track 2 (Event processing)

Experience with validating GEANT4 v7 and v8 against v6 in BaBar

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The BaBar experiment at SLAC has been using the GEANT 4 package version 6 for simulation of the detector response to passage of particles through its material.

Since 2005 and 2006, respectively, GEANT 4 versions 7 and 8 have been available, providing: improvements in modeling of multiple scattering; corrections to muon ionization and improved MIP signature; widening of the core of electro-magnetic shower shape profiles; newer implementation of elastic scattering for hadronic processes; exact implementation of Bertini cascade models for kaons and lambdas, and updated hadronic cross-sections from calorimeter beam tests.

The effects of these changes in simulation are studied in terms of closer agreement of simulation with respect to data distributions of: the hit residuals of tracks in the silicon-vertex tracker; the shower shapes of photons and K_L particles in the electro-magnetic calorimeter; the ratio of energy deposited in the electro-magnetic calorimeter and the flux return of the magnet instrumented with a muon detection system composed of resistive plate chambers, and limited streamer-tubes; and the muon identification efficiency in the muon detector system of the BaBar detector.

Submitted on behalf of Collaboration (ex, BaBar, ATLAS)

BaBar

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