The new ATLAS Fast Track Simulation engine (FATRAS)

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Various systematic physics and detector performance studies with the ATLAS detector require very large event samples. To generate those samples, a fast simulation technique is used instead of the full detector simulation, which often takes too much effort in terms of computing time and storage space. The widely used ATLAS fast simulation program ATLFAST, however, is based on intial four momentum smearing and does not allow tracking detector studies on hit level.

Alternatively, the new ATLAS Fast Track Simulation engine (FATRAS) that comes intrinsically with the recently developed track extrapolation package is capable of producing full track information, including hits on track. It is based on the reconstruction geometry and the internal navigation of the track extrapolation package that has been established in the restructured ATLAS offline reconstruction chain. Its modular design allows easy control of the inert material, detector resolutions and acceptance, the magnetic field configuration and the general noise level.

The application of the FATRAS simulation in a systematic detector performance study as well as a physics analysis will be presented.

-- AndreasSalzburger - 14 Oct 2005

This topic: Main > AbstractCHEP2005
Topic revision: r3 - 2005-10-16 - AndreasSalzburgerSecondary