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# Fast Simulation of the CMS detector at the LHC

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The experiments at the Large Hadron Collider (LHC) will start their search for answers to some of the remaining puzzles of particle physics in 2008. All of these experiments rely on a very precise Monte Carlo Simulation of the physical and technical processes in the detectors.

A fast simulation has been developed within the CMS experiment, which is between 100-1000 times faster than its Geant4-based counterpart, at the same level of accuracy. Already now, the fast simulation is essential for the analyses carried out in CMS, because it facilitates studies of high statistics physics backgrounds and systematic errors that would otherwise be impossible to evaluate.
Its simple and flexible design will be a major asset toward a quick and accurate tuning on the first data.

The methods applied in the fast simulation, both software and physics wise, are being outlined. This includes the concepts of simulating the interaction of particles with the detector material and the response of the various parts of the detector, namely the silicon tracker, the electromagnetic and hadron-calorimeters and the muon system.

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