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The new ATLAS Fast Calorimeter Simulation

Producing the very large samples of simulated events required by many physics and performance studies with the ATLAS detector

using the full Geant4 detector simulation is highly CPU intensive. Fast simulation tools are a useful way of reducing CPU requirements when detailed detector simulations are not needed. During the LHC Run-1, a fast calorimeter simulation (FastCaloSim) was successfully used in ATLAS. FastCaloSim provides a simulation of the particle energy response at the calorimeter read-out cell level, taking into account the detailed particle shower shapes and the correlations between the energy depositions in the various calorimeter layers. It is interfaced to the standard ATLAS digitization and reconstruction software, and it can be tuned to data more easily than Geant4. Now an improved version of FastCaloSim is in development, incorporating the experience with the version used during Run-1. The new FastCaloSim aims to overcome some limitations of the first version by improving the description of substructure variables for boosted jets, and giving a better performance in the forward calorimeters, which is important for forward jets in vector-boson-fusion topologies. A first prototype is available and is being tested and validated now. ATLAS plans to use this new FastCaloSim parametrization to simulate several billion events in the upcoming LHC runs. In this talk, we will describe this new FastCaloSim parametrisation.

Experimental Collaboration

ATLAS

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