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The new ATLAS Fast Calorimeter Simulation (15' + 5')

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A very large number of simulated events is required for physics and performance studies with the ATLAS detector at the Large Hadron Collider. Producing these with the full GEANT4 detector simulation is highly CPU intensive. As a very detailed detector simulation is not always required, fast simulation tools have been developed to reduce the calorimeter simulation time by a few orders of magnitude. The fast simulation of ATLAS for the calorimeter systems used in Run 1, called Fast Calorimeter Simulation (FastCaloSim), provides a parameterized simulation of the particle energy response at the calorimeter read-out cell level. It is then interfaced to the ATLAS digitization and reconstruction software. In Run 1, about 13 billion events were simulated in ATLAS, out of which 50% were produced using fast simulation. For Run 2, a new parameterisation is being developed to improve the original version: It incorporates developments in geometry and physics lists of the last five years and benefits from knowledge acquired with the Run 1 data. It uses neural network techniques to ameliorate the parameterisations as well as optimise the amount of information to be stored in the ATLAS simulation infrastructure. In this talk, we will review the latest developments of the new ATLAS Fast Calorimeter parametrisation.

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