

The Fast Simulation Chain in the ATLAS experiment

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The ATLAS experiment relies heavily on simulated data, requiring the production on the order of billions of Monte Carlo-based proton-proton collisions every run period. As such, the simulation of collisions (events) is the single biggest CPU resource consumer. ATLAS's finite computing resources are at odds with the expected conditions during the High Luminosity LHC era, where the increase in proton-proton centre-of-mass energy and instantaneous luminosity will result in higher particle multiplicities and roughly fivefold additional interactions per bunch-crossing with respect to LHC Run-2. Therefore, significant effort within the collaboration is being focused on increasing the rate at which MC events can be produced by designing and developing fast alternatives to the algorithms used in the standard Monte Carlo production chain.

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