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## **I - Detector Simulation for the LHC and beyond: how to match computing resources and physics requirements**

*Tuesday, 1 March 2016 10:00 (1 hour)*

Detector simulation at the LHC is one of the most computing intensive activities. In these lectures we will show how physics requirements were met for the LHC experiments and extrapolate to future experiments (FCC-hh case).

At the LHC, detectors are complex, very precise and ambitious: this implies modern modelisation tools for geometry and response. Events are busy and characterised by an unprecedented energy scale with hundreds of particles to be traced and high energy showers to be accurately simulated. Furthermore, high luminosities imply many events in a bunch crossing and many bunch crossings to be considered at the same time. In addition, backgrounds not directly correlated to bunch crossings have also to be taken into account.

Solutions chosen for ATLAS (a mixture of detailed simulation and fast simulation/parameterisation) will be described and CPU and memory figures will be given. An extrapolation to the FCC-hh case will be tried by taking as example the calorimeter simulation.

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