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Fast simulation developments in CMS (15' + 5')

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CMS is able to provide interpretation efficiently on large scans of new physics model parameter spaces, thanks to the availability of a fast simulation of the CMS detector, which serves as a fast and reliable alternative to the full, GEANT-based simulation. Fast simulation becomes particularly crucial with the current increase in LHC energy and luminosity. In this presentation, we will discuss the basic technical principles behind the CMS fast simulation framework, and how they are implemented in the different detector components, to simulate and reconstruct accurate physics objects. We will focus on recent developments which improve the flexibility and accuracy of the framework, and allow a better integration with the full simulation. We will then show how these developments lead to a very good agreement of fast simulation physics objects and variables with full simulation.

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