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# Designing and recasting LHC analyses with MadAnalysis 5

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The LHC experiments are currently pushing limits on new physics to a further and further extent. The interpretation of the results in the framework of any theory however relies on our ability to accurately simulate both signal and background processes. This task is in general achieved by matching matrix-element generator predictions to parton showering, and further employing hadronization and fast detector simulation algorithms. Phenomenological analyses can in this way be performed at several levels of the simulation chain, i.e., at the parton-level, after hadronization or after detector simulation.

This talk focuses on MadAnalysis 5, a unique analysis package dedicated to phenomenological investigations to be achieved at any step of the simulation chain. Within this framework, users are invited, through a user-friendly Python interpreter, to perform physics analyses in a very simple manner. An associated C++ code is then automatically generated, compiled and executed. Very recently, the expert mode of MadAnalysis 5 has been extended so that the notion of signal/control regions is now handled and additional observables are included. In addition, the program features an interface to several fast detector simulation packages, one of them being an optimized tune of the Delphes 3 package. As a consequence, it is now possible to easily recast existing CMS or ATLAS analyses within the MadAnalysis 5 framework. Finally, the new release of the program is more platform-independent and benefits from the graphical components of GnuPlot, MatplotLib and ROOT.

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