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MadFlow: towards the automation of Monte Carlo simulation on GPU for particle physics processes

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In this proceedings we present MadFlow, a new framework for the automation of Monte Carlo (MC) simulation on graphics processing units (GPU) for particle physics processes. In order to automate MC simulation for a generic number of processes, we design a program which provides to the user the possibility to simulate custom processes through the MG5_aMC@NLO framework. The pipeline includes a first stage where the analytic expressions for matrix elements and phase space are generated and exported in a GPU-like format. The simulation is then performed using the VegasFlow and PDFFlow libraries which deploy automatically the full simulation on systems with different hardware acceleration capabilities, such as multi-threading CPU, single-GPU and multi-GPU setups. We show some preliminary results for leading-order simulations on different hardware configurations.

Primary authors: CARRAZZA, Stefano (CERN); Dr CRUZ MARTÍNEZ, Juan M. (University of Milan); ROSSI, Marco (CERN); ZARO, Marco (Università degli Studi e INFN Milano (IT))

Presenter: Dr CRUZ MARTÍNEZ, Juan M. (University of Milan)

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