

Design and engineering of a simplified workflow execution for the MG5aMC event generator on GPUs and vector CPUs

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Physics event generators are essential components of the data analysis software chain of high energy physics experiments, and important consumers of their CPU resources. Improving the software performance of these packages on modern hardware architectures, such as those deployed at HPC centers, is essential in view of the upcoming HL-LHC physics programme. In this contribution, we describe an ongoing activity to reengineer the Madgraph5_aMC@NLO physics event generator, primarily to port it and allow its efficient execution on GPUs, but also to modernize it and optimize its performance on traditional CPUs. In our presentation at the conference, we will describe the motivation, engineering process and software architecture design of our developments, as well as some of the challenges and future directions for this project. We also plan to present the status and results of our developments at the time of the presentation, including detailed software performance metrics.

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