

Development of novel, portable Matrix Element + Phase Space methods

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For more than a decade the current generation of fully automated, matrix element generators has provided hard scattering events with excellent flexibility and good efficiency. However, as recent studies have shown, they are a major bottleneck in the established Monte Carlo event generator toolchains. With the advent of the HL-LHC and ever rising precision requirements, future developments will need to focus on computational performance, especially at intermediate to large jet multiplicities. We present a novel family of fast matrix element algorithms that are amenable for GPU acceleration, making use of modern, minimal color decompositions. Moreover, we discuss the performance achieved for standard candle processes such as V +jets and $t\bar{t}$ +jets production.

Presenter: KNOBBE, Max (University of Göttingen)

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