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Portable event generation on GPU-accelerated hardware

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High-precision calculations are crucial for the success of the LHC physics programme. However, the rising computational complexity for high-multiplicity final states is threatening to become a limiting bottleneck in the coming years. At the same time, the rapid deployment of non-traditional GPU-based computing hardware in data centres around the world demands an overhaul of the event generator design.

We propose a flexible and efficient approach for simulating collider events with multi-jet final states, based on the first portable leading-order parton-level event generation framework, along with an GPU-accelerated version of LHAPDF for fast and efficient evaluation of parton distribution functions. Our approach lends itself neatly to most modern GPU-accelerated hardware, allowing to better exploit computing resources in large-scale production campaigns, and paving the way for economically and ecologically sustainable event generation in the high-luminosity era.

Requested talk length

Authors: BOTHMANN, Enrico (University of Göttingen); KNOBBE, Max (University of Göttingen)

Presenter: KNOBBE, Max (University of Göttingen)

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