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Type: **Talk**

Accelerating Monte Carlo event generator analysis using efficient scalable data handling

Thursday 16 May 2024 11:15 (20 minutes)

In the age of GPU-accelerated event generation, pivotal community tools like HepMC and Rivet, vital for event generation infrastructure and Monte Carlo event analysis, risk becoming significant bottlenecks in the near future.

We present an adaptable and highly efficient approach to simulating collider events featuring multi-jet final states, encompassing both leading and next-to-leading order QCD calculations. Rooted in an enhanced parton-level event file format with streamlined scalable data management, our technique offers a scalable solution for producing high-precision calculations on HPC clusters using modern hardware architectures. We verify the efficacy of our framework across various processes, notably Higgs boson plus multi-jet production with up to seven jets, and showcase its integration within the Sherpa and Pythia event generators. Augmented by an enhanced interface for data management in massively parallel applications in Rivet4, our approach represents a significant step towards facilitating efficient data-model comparisons and statistical interpretations in collider physics.

Requested talk length

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