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Large-scale distributed usage of NLO and multi-leg Monte Carlo event generators on the grid and at Argonne Leadership Computing Facility

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The increases in both luminosity and center of mass energy of the LHC in Run 2 impose more stringent requirements on the accuracy of the Monte Carlo simulation. An important element in this is the inclusion of matrix elements with high parton multiplicity and NLO accuracy, with the corresponding increase in computing requirements for the matrix element generation step posing a significant challenge. We discuss the large-scale distributed usage of such generators in CMS Monte Carlo production, using both traditional grid resources, as well as the Argonne Leadership Computing Facility (ALCF), including associated challenges in software integration, effective parallelization, and efficient handling of output data.

Tertiary Keyword (Optional)

Computing facilities

Secondary Keyword (Optional)

Distributed workload management

Primary Keyword (Mandatory)

Event generators

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