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

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Poster Highlights

- CMS relies on detailed and large scale Monte Carlo production for modeling of the detector and underlying physics
- Strong motivation for NLO and/or multi-leg/merged-multiplicity Monte Carlo generators in order to achieve highest possible accuracy for final states with additional jets
- Several Monte Carlo generators have the capability to automatically generate matrix elements at LO and/or NLO for several jet multiplicities and consistently combine them at the parton shower level
- Despite technical challenges, large scale LHE/Matrix Element level production tightly integrated with CMS software and production infrastructure, over 30B events (before matching) produced in initial Run 2 production campaign
- Pursuing a number of technical improvements, as well as use of large-scale parallel computing facilities such as ALCF in order to more effectively use the generators/enable more complex physics processes

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