

# Unweighted event generation with matrix element surrogates - Poster

*Thursday 1 February 2024 16:30 (5 minutes)*

We show that employing a sophisticated neural network emulation of QCD multijet matrix elements based on dipole factorisation can lead to a drastic acceleration of unweighted event generation in high-multiplicity LHC production processes. We incorporate these emulations as fast and accurate surrogates in a two-stage rejection sampling algorithm within the SHERPA Monte Carlo that yields unbiased unweighted events suitable for phenomenological analyses and post-processing in experimental workflows, e.g. as input to a time-consuming detector simulation. For the computational cost of unweighted events we achieve a reduction by factors between 16 and 350 for the considered channels. We also show how this technique can be used for NLO calculations with emulated loop amplitudes.

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**Would you like to be considered for an oral presentation?**

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**Session Classification:** Poster Session

**Track Classification:** 8 ML for phenomenology and theory