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Computational developments of SHERPA and LHAPDF

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High-precision calculations are an indispensable ingredient to the success of the LHC physics programme, yet their poor computing efficiency has been a growing cause for concern, threatening to become a paralysing bottleneck in the coming years. We present a set of solutions to reduce the Monte Carlo footprint, focusing on the current cost-driving components: the evaluation of parton-distribution functions and the perturbative matrix elements. We show that for crucial samples, such as weak boson+jets as well as top-quark-pair production, these components dominate the overall run time by up to 80%. Focusing on improvements in LHAPDF and SHERPA, in particular in the unweighting step of the MC event generation, we reduce the computing times by factors of around 50 thereby paving the way towards affordable state-of-the-art event simulation in the HL-LHC era. Furthermore we give an outlook of next steps that can even further accelerate MC event generation and thereby facilitate even more precise computations.

Declaration

I certify that I have checked that I am authorised to submit the abstract with the listed co-authors with their current affiliations

Change of Speaker

I understand that change of speaker is allowed provided that no participant gives more than one talk. Otherwise, we will ask the speaker to choose between one or the other abstract to be presented.

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