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NNLO QCD corrections in full colour for jet observables at the LHC

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Calculations for processes involving a high multiplicity of coloured particles often employ a leading colour approximation, where only the leading colour levels in the expansion of the number of colours Nc are calculated and subleading colour levels, which are suppressed by powers of $1/N^2_c$ relative to the leading colour, are omitted. This approximation of the full colour result is motivated by the simple $1/N^2_c$ suppression and the increasing complexity of including subleading colour contributions to the calculation. In this work, we present the calculations using the antenna subtraction method in the NNLOJET framework for the NNLO QCD corrections at full colour for several jet observables at the LHC. The single jet inclusive cross section is calculated doubly differential in pT and absolute rapidity and compared with the CMS measurement at 13 TeV. A calculation for dijet production doubly differential in dijet mass and rapidity difference is also performed and compared with the ATLAS 7 TeV data. Lastly, a triply differential dijet cross section in average transverse momentum, rapidity separation and dijet system boost is calculated and compared with the CMS 8 TeV data. The impact of the subleading colour contributions to the leading colour approximation is assessed in detail.

Submitted on behalf of a Collaboration?

No

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