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W production and hadron colliders: the relevance of EW interactions in the resummation formalism

Tuesday 29 November 2022 14:00 (15 minutes)

An accurate determination of the Standard Model parameters is essential for both testing the theory and discovering signals of new physics. One of them is the W boson mass, which can be extracted with great precision by measuring W/Z bosons productions rates at hadron colliders.

In this talk, I will consider transverse-momenta spectra at low- and intermediate- q_T region. Large logarithmic contributions, due to soft and collinear emission, are evaluated and resummed at all orders through the well-established resummation formalism. A matching procedure is also implemented in order to obtain uniform accuracy until the high- p_T region, in which cross sections are correctly computed through the conventional fixed-order perturbative series.

Although the dominant contributions to the differential cross sections are due to QCD, already known in literature until N³LL+NNLO, the consideration of EW interaction becomes essential to reach the sub-percent level of precision, i.e. the current accuracy of experimental data.

In our work, specifically, we computed EW corrections including up to NLL+NLO terms, and inserted them in a numerical code.

During the discussion, I will show some significative plots at typical LHC, Tevatron and FCC-hh configurations, focusing on the shifts and behavior-changes caused by electroweak interactions. These modifications, in particular, affects directly the W boson mass determination.

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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