

Contribution ID: 146

Type: not specified

One-loop electroweak Sudakov logarithms: a revisitation and automation

Wednesday 28 September 2022 14:00 (15 minutes)

In order to obtain reliable theoretical predictions for collider physics, radiative corrections have to be computed and taken into account in Monte Carlo simulations. In particular, at high energies, electroweak (EW) radiative corrections are dominated by the so-called EW Sudakov logarithms, which are negative and large in absolute value. In this talk I will present a revisitation of the algorithm of Denner and Pozzorini (DP) for the calculation of one-loop electroweak Sudakov logarithms. With our revisitation, we have added several novelties to the DP algorithm. For instance, we have obtained a substantial improvement of the approximation of those logarithms that are angular dependent. Moreover, we have identified an imaginary term that has been so far omitted in the literature and that instead cannot be neglected for 2 -> n processes with n >2. I will discuss results that we have obtained in a completely automated approach via the implementation of our revisitation of the DP algorithm in the MadGraph5_aMC@NLO framework. After having discussed the case of one-loop amplitudes I will move to the case of NLO EW corrections to physical observables and cross sections, introducing a new approach for their Sudakov approximation.

Summary

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Session Classification: Parallel Session Wednesday

Track Classification: Particle Phenomenology