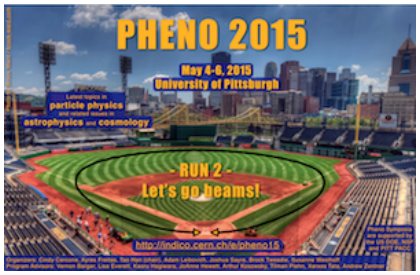

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Electroweak Corrections at the LHC

Tuesday 5 May 2015 16:45 (15 minutes)

Electroweak (EW) corrections at the LHC can be enhanced at high energies due to soft/collinear radiation of W and Z bosons, being dominated by Sudakov-like corrections in the form of $\alpha_W^l \log^n(Q^2/M_W^2)$ $(n \leq 2l-1, \alpha_W = \frac{\alpha}{4\pi \sin\theta_W^2})$ when the energy scale Q enters the TeV regime. Thus, the inclusion of EW corrections in LHC predictions is important for the search of possible new physics in tails of distributions. EW corrections should also be taken into account in virtue of its comparable size ($\mathcal{O}(\alpha)$) to that of higher order QCD corrections ($\mathcal{O}(\alpha_s^2)$).
We calculated the next-to-leading-order (NLO) weak corrections to the neutral-current (NC) Drell-Yan process, top-quark pair production and dijet producion, respectively, and implemented them in the Monte-Carlo program MCFM. This enables a combined study with the corresponding NLO QCD corrections. We provide both the full NLO weak corrections and their weak Sudakov approximation valid at high energies. The latter is often used for a fast evaluation of weak effects, and having the exact result available as well allows to quantify the validity of the Sudakov approximation.

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