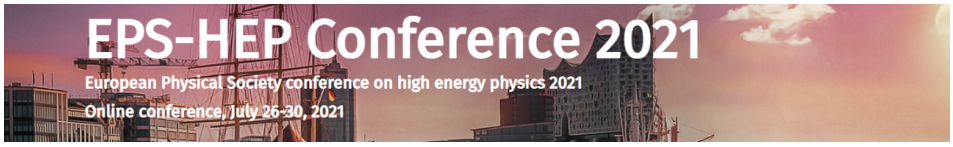

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Mixed QCD-EW corrections to Drell-Yan at the LHC

Wednesday, 28 July 2021 17:00 (15 minutes)

Drell-Yan lepton pair production is a benchmark process at hadron colliders.
From the theoretical side, the inclusion of higher-order radiative corrections is mandatory
in order to match the experimental accuracy attainable at the LHC.
QCD radiative corrections are known up to order α_s^3 for inclusive cross
sections and up to order α_s^2 for differential observables; EW corrections are known up to order $alpha$.
At this level of precision, the inclusion of mixed QCD-EW corrections becomes relevant.

We report on the first complete computation of the mixed QCD–EW corrections to
the neutral- and charged- current Drell–Yan processes. In the former case, the two-loop virtual contribution
is computed exactly by using semi-analytical techniques, overcoming the technical problems in the evaluation
of the relevant master integrals, and it is compared to an “improved” pole approximation, employed for the
charged-current process. The cancellation of soft and collinear singularities is
achieved by a formulation of the q_T-subtraction formalism valid in presence of charged massive particles
in the final state.

Superseding previously applied approximations, our calculation provides the first result at this order
that is valid in the entire range of invariant masses of the charged lepton-anti-lepton pair.

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