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Electroweak corrections to vector-boson pair production at the LHC

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W-boson pair production has been studied extensively during the LEP era, amongst others leading to a precise determination of the W-boson mass and width. At the LHC, vector-boson pair production will be of similar importance. Such processes constitute an important irreducible background to SM-Higgs production in the intermediate-mass region and have already been used to exclude a wide range of mass parameters. Moreover, vector-boson pair production is a perfect candidate to probe the non-abelian structure of the SM at highest energies, possibly facilitating the discovery of BSM physics. Therefore, it is obvious that theoretical predictions with high accuracy are needed to benefit from the great experimental possibilities provided by the LHC.

In this work, we present the first calculation of the full one-loop electroweak corrections to WW, WZ, and ZZ production at hadron colliders, which give rise to large contributions at high transverse momenta. In addition, photon-induced processes are discussed in detail which contribute significantly to the W-pair production cross section at high invariant masses.

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