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Direct photon production with effective field theory

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The production of hard photons in hadronic collisions is studied using Soft-Collinear Effective Theory (SCET). This is the first application of SCET to a physical, observable cross section involving energetic partons in more than two directions. The final resummed inclusive direct photon distribution is valid to next-to-next-to-leading logarithmic order (NNLL), one order beyond previous work. The result is improved by including non-logarithmic terms and photon isolation cuts through matching, and compared to Tevatron data and to fixed order results at the Tevatron and the LHC. The resummed cross section has a significantly smaller theoretical uncertainty than the next-to-leading fixed-order result, particularly at high transverse momentum.

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