

# Complete NLO corrections to top-quark pair production with isolated photons

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We report on the computation of NLO QCD corrections to top-quark pair production in association with two photons at the LHC. Higher-order effects and photon bremsstrahlung are taken into account in the production and decays of the top-quark pair. Top-quark and W-boson decays are treated in the Narrow Width Approximation conserving spin correlations up to NLO in QCD. This is the first time that the complete set of NLO QCD corrections to the  $pp \rightarrow t\bar{t}\gamma\gamma$  process including top-quark decays is calculated. We present results at the integrated and differential cross-section level in the di-lepton and lepton + jet channel. In addition, we investigate the effect of photon bremsstrahlung in  $t\bar{t}$  production and top-quark decays, as well as the mixed contribution. The latter contribution, in which two photons occur simultaneously in the production and decay of the  $t\bar{t}$  pair, proved to be significant at both the integrated and differential cross-section level.

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