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Measurements of $t\bar{t}+X$ using the ATLAS detector

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The large centreofmass energy available at the protonproton collider LHC allows for the copious production of top quark pairs in association with other final state particles at high transverse momentum. The ATLAS experiment has measured several final state observables that are sensitive to additional radiation in top antitop quark final states. Results on the top production in association with W and Z bosons at both 8 and 13 TeV are presented along with measurements of the cross section for production with an associated isolated photon at 8 TeV. Analyses probing the top pair production with additional QCD radiation include the multiplicity of jets for various transverse momentum thresholds in the 13 TeV data. These measurements are compared to modern Monte Carlo generators based on NLO QCD matrix element or LO multileg matrix elements.

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