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Probing the SM and beyond with top quarks, jets and photons in the ATLAS experiment

In this contribution, recent results of the ATLAS experiment are presented in pp collisions at sqrt(s) = 13 TeV that test the predictions of the Standard Model in production of jets and top quarks in association with energetic photons. We present the latest measurements on production of jets with new event-shape jet observables defined in terms of reference geometries with cylindrical and circular symmetries using the energy mover's distance. In addition, prompt inclusive photon production is measured for two distinct photon isolation cones, R=0.2 and 0.4, as well as for their ratio. Results are furthermore presented of searches in several associated top quark production processes with Standard Model gauge bosons, among which the recent observation of associated production of a single top quark with a photon. Finally bounds are presented on flavour-changing-neutral-current (FCNC) interactions, derived from searches of rare and suppressed top quark decay and production mechanisms.

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