

# ATLAS ttH measurements in the H- $\rightarrow$ gamma gamma channel

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Higgs production in association with top quarks (ttH) is predicted by the Standard Model at a rate of about 1% of the total Higgs cross section. This process directly probes the Higgs-top coupling, a critical parameter for isolating Beyond the Standard Model contributions to Higgs physics. The ATLAS search for ttH events in conjunction with the decay  $H \rightarrow \gamma\gamma$  takes advantage of the high photon detection efficiency and energy resolution of the ATLAS electro-magnetic calorimeter, as well as the relatively low rate of diphoton background processes. The application of sophisticated multivariate techniques to identify  $ttH \rightarrow \gamma\gamma$  events improves the sensitivity to ttH compared to past analyses. In combination with other Higgs decay channels,  $ttH \rightarrow \gamma\gamma$  contributed to the recent discovery of the ttH production mode.

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