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## Search for the associated production of a Higgs boson and a top quark pair in multilepton (2 leptons, no hadronically-decaying $\tau$ lepton candidates and 4 leptons) final states with the ATLAS detector.

The Yukawa coupling of the Higgs boson to the top quark is a key parameter of the Standard Model. It can be constrained using the associated production process  $pp \rightarrow t\bar{t}H + X$ .

A search for this process using final states with multiple leptons, primarily targeting the decays  $H \rightarrow WW^*$  and  $H \rightarrow \tau\tau$ , has been performed using the data set recorded by the ATLAS detector in 2015 and 2016 at a center of mass energy  $\sqrt{s} = 13$  TeV.

The analysis presented here includes two of the four final states distinguished by the number and flavor of leptons: two same-charge light leptons ( $e$  or  $\mu$ ) and no hadronically-decaying  $\tau$  lepton candidates ( $2l0\tau_{had}$ ) and four light leptons ( $4l$ ), the remaining channels not covered being two same-charge light leptons and one hadronically-decaying  $\tau$  lepton candidate ( $2l1\tau_{had}$ ) and three light leptons ( $3l$ ). The different background sources are also presented for each channel considered. The latest best-fit value for the ratio of observed versus

Standard Model cross sections is then given as well as an upper limit on this parameter.

### Experimental Collaboration

ATLAS

**Primary author:** ROZEN, Yoram (Technion (IL))

**Presenter:** DUMITRIU, Ana Elena (IFIN-HH Bucharest (RO), CPPM (Aix-Marseille Université, CNRS/IN2P3, FR))

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