

# Search for Higgs Boson Pair Production in the Multi-lepton Final State Using Proton-Proton Collision Data at $\sqrt{s} = 13$ TeV from the ATLAS Detector

*Saturday, 9 April 2022 13:00 (20 minutes)*

This talk will present a search strategy for Higgs boson pair-production in final states with three electrons or muons. The analysis is performed using an integrated luminosity of  $139 \text{ fb}^{-1}$  of  $pp$  collision at  $\sqrt{s} = 13$  TeV collected by the ATLAS detector at the LHC. There are many decay modes of Higgs boson pairs that have low branching ratios, and many of these are not covered by dedicated analyses. Some example modes of particular interest for a three lepton final state are  $WWWW$ ,  $WW\tau\tau$ ,  $\tau\tau\tau\tau$ , etc. This talk presents the development of a multivariate strategy (boosted decision trees) and current work on background estimation methods and statistical analysis.

## Career stage

Graduate student

**Author:** PARAJULI, Santosh (Southern Methodist University (US))

**Presenter:** PARAJULI, Santosh (Southern Methodist University (US))

**Session Classification:** Higgs