Contribution ID: **183** Type: **Oral report**

Initial Results on Higgs Pair Production in Multi-Lepton Channels with the ATLAS Experiment

This talk presents the first comprehensive search for non-resonant Higgs boson pair (HH) production in multiple-lepton decay channels, including VVVV, VVtautau, tautautautau, yyVV, and yytautau, where V is W or Z boson. The analysis also explores decays of HH to bbZZ with the Z bosons decaying into leptons. Data is derived from proton-proton collisions at 13 TeV, captured by the ATLAS detector during LHC's Run 2, with an integrated luminosity of 140 fbˆ-1. While no evidence of HH production is observed, an upper limit is set on the signal strength, and 2sigma constraints are determined for the HHH coupling modifier, kappa_lambda.

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Session Classification: 分会场一

Track Classification: TeV 物理和超出标准模型新物理