

Probing the nature of electroweak symmetry breaking with Higgs boson pairs in ATLAS

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In the Standard Model, the ground state of the Higgs field is not found at zero but instead corresponds to one of the degenerate solutions minimising the Higgs potential. In turn, this spontaneous electroweak symmetry breaking provides a mechanism for the mass generation of nearly all fundamental particles. The Standard Model makes a definite prediction for the Higgs boson self-coupling and thereby the shape of the Higgs potential. Experimentally, both can be probed through the production of Higgs boson pairs (HH), a rare process that presently receives a lot of attention at the LHC. In this talk, the latest non-resonant HH searches by the ATLAS experiment are reported. Results are interpreted both in terms of sensitivity to the Standard Model and as limits on the Higgs boson self-coupling. A combined measurement of single and double Higgs production results are presented based on pp collision data collected at a centre-of-mass energy of 13 TeV with the ATLAS detector.

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