

Phenomenology 2022 Symposium: From Virtual to Real



Contribution ID: 116

Type: not specified

Probing the nature of electroweak symmetry breaking with Higgs boson pair-production at ATLAS

Tuesday 10 May 2022 15:00 (15 minutes)

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 HH searches by the ATLAS experiment are reported, with emphasis on the results obtained with the full LHC Run 2 dataset at 13 TeV. In the case of non-resonant HH searches, results are interpreted both in terms of sensitivity to the Standard Model and as limits on the Higgs boson self-coupling. Extrapolations of recent HH results towards the High Luminosity LHC upgrade are also discussed. Search results on new resonances decaying into pairs of Higgs bosons are also reported.

Author: VELISCEK, Iza (University of Oxford (GB))

Co-author: THE ATLAS COLLABORATION

Presenter: VELISCEK, Iza (University of Oxford (GB))

Session Classification: Higgs II