Contribution ID: **53** Type: **not specified**

Constraining the Higgs boson self-coupling via indirect single-Higgs production and decay measurements

Wednesday, 2 October 2019 15:00 (10 minutes)

After the discovery of the Higgs boson, one of the main targets of particle physics is the measurement of the Higgs boson couplings to fermions and vector bosons. Moreover, also of great interest is the observation of the interaction of the Higgs boson with itself, known as the Higgs boson self-coupling. The self-coupling is very loosely constrained by EWK precision measurements therefore new physics effects could induce large deviations from its SM expectation. The self-coupling can be measured directly using the Higgs boson pair production cross section, or indirectly through the measurement of the single-Higgs boson production and decays. In fact, at next-to-leading order in EW interaction the Higgs-decay partial widths and the cross sections of the main single-Higgs production processes depend on the Higgs boson self-coupling via weak loops. Moreover, changes in the Higgs boson self-coupling affect also the Higgs boson differential distribution, like the transverse momentum. In this talk, measurements of the Higgs boson self-coupling using single-Higgs production combining the data of the analyses targeting the γγ, ZZ*, WW*, ττ, bb decay channels and using both inclusive and differential information, will be presented. The results are obtained using ATLAS data corresponding to a luminosity of up to 80 fb−1.

Primary author: ATLAS, Collaboration (CERN)

Presenter: ROSSI, Eleonora (Universita e INFN Roma Tre (IT))

Session Classification: Parallel