

# Measurement of Higgs boson mass and width using bosonic decay channels with the ATLAS detector

*Tuesday, November 8, 2022 9:00 AM (15 minutes)*

The mass of the Higgs boson can be measured in the Higgs to four leptons and Higgs to two photons decay channels, where the excellent mass resolution can be used to reconstruct the Higgs boson invariant mass. The same decays can be used to measure the Higgs boson natural width, either by exploiting the offshell Higgs contribution to the four leptons and two leptons plus two neutrinos production at high mass, or the interference of the Higgs to diphotons decay with the diphotons continuous production. This talk presents the most recent measurements of Higgs boson mass and width by the ATLAS experiment exploiting the Higgs boson decays into two photons or four leptons, using the full Run 2 dataset of pp collisions collected at 13 TeV at the LHC. This talk also reviews recent improvements of the muon reconstruction, identification and momentum calibration in ATLAS, crucial to the measurement of the Higgs boson mass in the four-lepton channel. New analysis techniques are exploited, including multivariate analyses for rejecting background hadrons from prompt muons from the hard interactions, as well as in-situ corrections significantly reducing biases in muon momenta induced by residual detector displacements

## Type of talk

Experimental measurements

**Presenter:** ARTONI, Giacomo (Sapienza Universita e INFN, Roma I (IT))

**Session Classification:** Tuesday Session A

**Track Classification:** Physics Topics: Precision measurements