

# Fiducial and differential cross sections of Higgs boson production measured in the four-lepton decay channel in pp collisions at $\sqrt{s}=8$ TeV with the ATLAS detector

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## Abstract:

Measurements of fiducial and differential cross sections of Higgs boson production in the  $H \rightarrow ZZ^* \rightarrow 4 \ell$  decay channel are presented. The cross sections are determined within a fiducial phase space and corrected for detection efficiency and resolution effects. They are based on 20.3 fb<sup>-1</sup> of pp collision data, produced at  $\sqrt{s} = 8$  TeV centre-of-mass energy at the LHC and recorded by the ATLAS detector. The differential measurements are performed in bins of transverse momentum and rapidity of the four-lepton system, the invariant mass of the subleading lepton pair and the decay angle of the leading lepton pair with respect to the beam line in the four-lepton rest frame, as well as the number of jets and the transverse momentum of the leading jet. The measured cross sections are compared to selected theoretical calculations of the Standard Model expectations. No significant deviation from any of the tested predictions is found.

**Keywords:** -