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## A precision measurement of fiducial and differential cross-sections of $WW$ production with the ATLAS detector

Measuring the production of  $W$ -boson pairs at particle colliders provides an important test of the predictions of the Standard Model (SM) of particle physics in both perturbative quantum chromodynamics and electroweak domains. In this measurement, fiducial and differential cross sections are obtained using the full Run 2 dataset collected in proton-proton collisions at the LHC at a centre-of-mass energy of 13 TeV with the ATLAS detector, corresponding to an integrated luminosity of  $140 \text{ fb}^{-1}$ . The number of events due to top-quark pair production, the largest background, is reduced by rejecting events containing jets with  $b$ -hadron decays. Background contributions from top-quark and non-prompt leptons are estimated using data-driven techniques. In contrast to most previous measurements that enhance the  $WW$  signal purity by vetoing hadronic jets in the final state, the first measurement of  $WW$  cross-sections using a fully jet-inclusive selection is presented in this work. The fiducial  $WW$  cross-section is determined in a maximum-likelihood fit with an uncertainty of 3.1%, providing the most precise cross-sections of  $WW$  production achieved in hadron-hadron collisions to date. The measurement is extrapolated to the full phase space, resulting in a total  $WW$  production cross-section of  $124 \pm 4 \text{ pb}$ . Differential cross-sections are measured as a function of twelve observables describing the kinematics of the  $WW$  system. An excellent agreement with state-of-the-art SM theory predictions is observed.

### Collaboration / Activity

ATLAS

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