

# Measurements of differential cross-sections of top-quark-antiquark pair-production with the ATLAS detector

*Tuesday, 28 July 2020 17:45 (25 minutes)*

Comprehensive measurements of differential cross-sections of top-quark-antiquark pair-production are presented. The measurements are performed in the electron-muon, the lepton+jets and the all-hadronic channels. The latter two allow for reconstruction of the top-quark and top-quark-pair kinematic distributions. In the electron-muon channel, kinematic properties of the two leptons are measured differentially. High sensitivity of some distributions to PDFs is demonstrated. The lepton+jets and all-hadronic channels are complementary in terms of range and resolution for several top-quark variables. All three measurements use data recorded in the years 2015 and 2016 during Run 2 of the LHC. The measurements are compared quantitatively with predictions from several setups of next-to-leading order matrix-element generators combined with parton-shower generators and from fixed order calculations at NNLO in QCD. In addition, the total cross-section is measured in the electron-muon channel. A precision of 2.4 % is reached, well below the uncertainty of predictions at next-to-next-to-leading order in QCD. The total cross-section is compared to predictions by different sets of parton distribution functions and is used to determine the top-quark mass. A total cross-section measurement based on the full Run 2 dataset in the lepton+jets channel is also presented.

## I read the instructions

## Secondary track (number)

**Primary author:** KHOO, Teng Jian (University of Innsbruck (AT))

**Presenter:** KHOO, Teng Jian (University of Innsbruck (AT))

**Session Classification:** Top Quark and Electroweak Physics

**Track Classification:** 04. Top Quark and Electroweak Physics