



Contribution ID: 68

Type: not specified

## Measurement of the Production Cross Section of a Z Boson in Association with Jets in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS Detector

Measurements are presented of the production cross section for a Z boson in association with jets in  $\sqrt{s} = 13$  TeV pp collisions. Data correspond to an integrated luminosity of  $3.16 \text{ fb}^{-1}$  collected by the ATLAS experiment at the Large Hadron Collider in 2015. Inclusive and differential cross sections are measured for events in which a Z boson decays to electrons or muons, and is produced in association with one or more jets in the kinematic range of  $p_T(\text{jet}) > 30$  GeV and rapidity  $|y(\text{jet})| < 2.5$ . The fiducial production cross sections for Z Bosons with inclusive zero to seven jets have been measured with a precision ranging from 3% to 20%, respectively. Ratios of cross sections for successive jet multiplicities are presented as well as cross sections as a function of jet pT for  $Z + 1$  jet events, leading jet pT for  $Z + \geq 1, 2, 3, 4$  jet events, leading jet rapidity for  $Z + \geq 1$  jet events,  $H_T$ ,  $\Delta\phi_{jj}$ , and  $m_{jj}$ . Observed cross sections are compared to predictions from several Monte Carlo generators based on leading-order and next-to-leading-order matrix elements interfaced with parton shower and hadronization models, as well as to next-to-leading order and next-to-next-to-leading order fixed-order predictions. Agreement within uncertainties is observed between measured cross sections and predictions. Presented results provide essential input for the further optimization of Monte Carlo generators for Z+jet production, and constitute a powerful test of perturbative QCD.

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