

# Z boson jet momentum imbalance in pp collisions at STAR

Thomas Limoges, Lehigh University  
For the STAR Collaboration

August 3, 2020

## Abstract

Proton-proton collisions at RHIC with center of mass energy  $\sqrt{s} = 500$  GeV produce Z bosons that recoil off jets. In this analysis, Z boson transverse momentum ( $p_T$ ) is compared to away-side jet  $p_T$ , and the ratio,  $x_{\text{jet,Z}} = p_{T,\text{jet}}/p_{T,Z}$  is measured. Utilizing data from the STAR experiment, the invariant mass method is used to identify Z bosons from their lepton pair decays. Candidate Z bosons are selected with a narrow window around the mass peak near 90 GeV where the background contribution is significantly suppressed. Jets can be identified using the anti- $k_T$  algorithm from the Fastjet package. Performance of the  $x_{\text{jet,Z}}$  measurement is studied with Pythia 8 event generator based on the Z boson statistics from STAR 2017 data.