

Electroweak Bosons in Heavy Ion Collisions with the ATLAS Detector

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Electroweak bosons processes (W, Z and photon) provide experimental controls over initial geometric and nuclear PDFs (nPDFs). The ATLAS has measured the production of all three bosons in Pb+Pb at 2.76 TeV and the production of Z bosons in p+Pb collisions at 5.02 TeV. Z bosons are measured via both di-electron and di-muon decay channel. W bosons are measured with isolated single leptons and missing transverse energy constructed from tracks. Photons are measured using ATLAS electromagnetic calorimeter and calorimeter-based isolation observables. The yields of all three bosons in Pb+Pb collisions are found to obey binary collision scaling. But Run 1 Pb+Pb data is not yet sensitive enough to discern specific features of nPDF effects. The Z yield in p+Pb collisions provide another excellent opportunity to test nPDF effects. In addition, the centrality dependence of Z boson production in p+Pb is measured and analyzed within standard Glauber model and the Glauber-Gribov model with event-by-event fluctuations. The effects of hard scattering biases on the centrality categorization in p+Pb are addressed.

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