Abstract Submitted
for the DNP20 Meeting of
The American Physical Society

New constraints of initial states in PbPb collisions with Z boson yields and azimuthal anisotropy at $\sqrt{s_{NN}}$ = 5.02 TeV AUSTIN BATY, Rice University, CMS COLLABORATION COLLABORATION — The differential yields of Z bosons decaying to a pair of leptons are measured in PbPb collisions collected by the CMS experiment at the LHC. The measurements are performed for collisions at 5.02 TeV, using both the muon and electron decay channels. The yields in various centrality bins are compared to Glauber model predictions of the production rates of hard probes not modified by the presence of a hot medium. For the first time, Z boson yields in peripheral collisions are found to deviate from the canonical scaling expected for colorless hard probes, indicating the presence of initial collision geometry and centrality selection biases. Because the measurement uncertainties are comparable to the uncertainties of a Glauber-scaled reference, Z boson yields can now be used as an experimental measure of the effective nucleon-nucleon luminosity without loss of precision. A high precision measurement of the Z boson azimuthal anisotropy (v_2) is also found to be compatible with zero, showing that Z bosons do not experience significant final-state modification in heavy ion collisions.

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Date submitted: 25 Jun 2020 Electronic form version 1.4