

Abstract Submitted  
for the DNP19 Meeting of  
The American Physical Society

**Determining Collision Event Centrality Using the Event Plane Detector at the STAR Experiment**<sup>1</sup> SKIPPER KAGAMASTER, Lehigh University, STAR COLLABORATION<sup>2</sup> — Heavy ion physicists have been lately concerned with investigating the possibility of a critical point and a first order phase transition in the phase diagram for Quantum Chromodynamics (QCD). Most observables aimed at the determination of these phase properties rely on centrality determination, which is the degree of overlap for the colliding particles. The STAR experiment currently uses the Time Projection Chamber (TPC) to determine centrality; however, the TPC spans the same rapidity acceptance as many of the observables. This talk will focus on the potential to use the STAR Event Plane Detector (EPD), which is located at forward rapidity of  $2.1 < |\eta| < 5.1$ , for this purpose in order to prevent autocorrelations in analysis. We will show how well centrality determinations from these two detectors agree for Au+Au collisions at  $\sqrt{s_{NN}} = 27$  GeV.

<sup>1</sup>NSF grant numbers 1614474 and 1913696.

<sup>2</sup>STAR Collaboration at RHIC (BNL)

Skipper Kagamaster  
Lehigh University

Date submitted: 30 Jun 2019

Electronic form version 1.4