

Higher-Order Cumulants of Net-Proton Multiplicity Distributions in Au+Au $\sqrt{s_{NN}} = 3$ GeV at STAR

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Abstract

1 The first RHIC Beam Energy Scan (BES-I), $\sqrt{s_{NN}} = 7.7$ GeV to $\sqrt{s_{NN}} =$
2 200 GeV, was run from 2010-2014 to search for the turn-off signatures of the
3 quark-gluon plasma (QGP). The QGP signatures studied in BES-I became in-
4 sensitive at energies below $\sqrt{s_{NN}} = 19.6$ GeV. The fluctuations in the event-by-
5 event net-proton multiplicities exhibited a dip in the kurtosis \times variance of the
6 net-proton number at $\sqrt{s_{NN}} = 19.6$ GeV and a rise at 7.7 GeV(1). Motivated
7 by the findings of BES-I, STAR has initiated a phase II of the BES program
8 (BES-II) and the Fixed Target program. The BES-II program improves upon
9 the earlier BES-I program with increased detector acceptance, luminosity, and
10 statistics at each energy, while the Fixed Target program extends the minimum
11 energy. In this talk, results from the 2018 first dedicated fixed target physics
12 run at $\sqrt{s_{NN}} = 3$ GeV will be presented. We will discuss the cumulants of
13 event-by-event net-proton multiplicities as a function of rapidity and central-
14 ity. The results will be compared to results from the BES-I program and the
15 HADES experiment.

16 References

- 17 1. J. Adam *et al.*, (STAR), arXiv: 2001.02852 (nucl-ex) (Jan. 2020).