

Measurements of π , K, p spectra in fixed target collisions with STAR

Mathias Labonté (for the STAR Collaboration), UC Davis

April 3, 2023

Abstract

One of the main physics goals of the Beam Energy Scan (BES) at RHIC is to study the phase diagram of the QCD matter, which separates a phase of quark-gluon plasma (QGP) from a phase of hadronic gas. The first phase of BES studied Au+Au collisions from center-of-mass energy ($\sqrt{s_{NN}}$) of 7.7 to 62.4 GeV. The BES Phase-II extended these measurements in several important ways, one of which was the addition of a fixed target program that pushed the energy reach down to a $\sqrt{s_{NN}}$ of 3.0 GeV (or μ_B up to 720 MeV). Fixed target collisions at STAR allow for a more extensive scanning of the QCD phase diagram to an important region where the QCD critical point may lie, and to a region dominated by dense baryonic matter. Light-flavor hadron production can constrain theoretical models of QCD dynamics, thus providing a method of identifying the transition from a hadronic gas to the QGP. In this poster, preliminary results on the yields of light-flavor hadrons [π , K, p] from fixed target Au+Au collisions at STAR will be presented.