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Comparison of STAR Au + Au √(s_NN)=4.5 GeV Fixed-Target and AGS Au + Au Fixed-Target Spectra, Strangeness, Flow and HBT

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The RHIC Beam Energy Scan (BES) Program was proposed to look for the turn-off of signatures of the quark gluon plasma (QGP), search for a possible QCD critical point, and study the nature of the phase transition between hadronic and partonic matter. The results from the NA49 experiment at CERN have been used to claim that the onset of deconfinement occurs at √(s_NN) ≈7 GeV, the low end of the BES range. Additionally, studies of several interesting observables during the BES, including v1 of protons and lambdas, v2 of identified hadrons, and net-proton higher moments, show interesting behavior below 20 GeV and could suggest a transition to a hadron dominated regime. Data from energies lower than 7 GeV could help determine whether these behaviors are indicative of phase transitions or criticality. The goal of the STAR Fixed-Target Program is to extend the collision energy range in BES-II with the same detector to lower energies than is feasible at RHIC with colliding beams.

In this talk we present results from STAR's first dedicated fixed-target test run conducted in 2015 with Au + Au collisions at √(s_NN)=4.5 GeV. Direct flow of protons, elliptic flow of identified hadrons, HBT radii, as well as pion, proton, kaon, K_S^{0}, and lambda spectra are compared with previous results from the Alternating Gradient Synchrotron (AGS). These results demonstrate that STAR has good event reconstruction and particle identification capabilities for this fixed-target configuration even though it was optimized for colliding beams in the center of the detector. The implications of these results on future STAR fixed-target physics runs are discussed.

Preferred Track

Baryon-Rich QCD Matter and Astrophysics

Collaboration

STAR

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