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The fixed-target experiment in STAR @ RHIC

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The RHIC Beam Energy Scan (BES-I) program, which covers center-of-mass energies
7.7 GeV to 39 GeV, was proposed to look for the turn-off of signatures of the quark gluon
plasma, search for a possible QCD critical point, and study the nature of the phase transition between hadronic and partonic matter. RHIC BES-I has shown that the partonic interactions are dominant at center-of-mass energies above 20 GeV.
Several observables, including v1 of protons and Lambdas, v2 of all identified hadrons, and net-proton higher moments, show interesting behavior below 20 GeV and could suggest a transition to a hadron interaction 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 to lower energies than what is feasible at RHIC with colliding beams. The implications for the fixed-target program after the completion of the inner TPC (iTPC) and endcap TOF (eTOF) detector upgrades will also be discussed.

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Research Advisor

Rene Bellwied

Author: RUTIK, FNU

Presenter: RUTIK, FNU

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