STAR Highlights

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Abstract

STAR is a multipurpose detector with excellent particle identification capabilities, operating at Relativistic Heavy Ion Collider (RHIC) at BNL. Recently, STAR has completed data taking for the second phase of the Beam Energy Scan program at RHIC (BES-II) and the Isobar collisions program. The BES-II program includes dedicated low beam energy runs and a fixed-target program covering the energy range $\sqrt{s_{NN}} = 3$ -19.6 GeV/c^2, allowing for exploration of the high baryon density region of the QCD physics. The BES-II program also includes iTPC, EPD and eTOF detector upgrades which will increase STAR's acceptance both in rapidity and low transverse momentum and extent its particle identification capabilities. With new datasets and dataset from U+U and d+Au collisions, STAR collaboration will present a series of measurements related to charged particles, strange hadrons, heavy quarks, dielectrons, light nuclei as well as hypernuclei. STAR is also taking high statistics p+p and Au+Au data in RHIC runs from 2023-25 with dedicated forward upgrades and the detector upgrades from BES-II. These datasets provide unique opportunities to investigate the microstructure of Quark-Gluon Plasma (QGP) and the unique forward cold QCD physics. The outlook on these measurements will also be discussed.