STAR (non-spin physics) Highlights

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Abstract

The STAR experiment at the Relativistic Heavy Ion Collider (RHIC) leverages the unique versatility of RHIC to collide a diverse range of species, from proton through ruthenium to gold ion collisions, offering unprecedented insights into the quark-gluon plasma (QGP). Additionally, the STAR Beam Energy Scan (BES) program aims to explore the QCD phase diagram across a broad range of chemical potentials by utilizing gold ion collisions and a fixed-target mode at lower center-of-mass energies $\sqrt{s_{NN}} = 3 - 27$ GeV. With the detector upgrades, the second phase of the BES (BES-II) program that has recently completed its data taking, allows it to investigate the phase diagram with greater precision.

This talk will present the latest results from the STAR experiment, related to analyses of charged and strange particles, hard probes, dielectrons, light nuclei, and hypernuclei. The outlook on measurements with the RHIC 2023-25 p+p and Au+Au runs at $\sqrt{s_{NN}} = 200$ GeV that aim to study the microstructure of QGP will also be discussed.