

STAR Forward Upgrade Program

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Abstract

The STAR Collaboration has successfully completed the upgrade of the forward detector system located between $2.5 < \eta < 4.0$. This upgrade comprises a Forward Calorimeter System, which contains an Electromagnetic Calorimeter and Hadronic Calorimeter, and a Forward Tracking System which consists of a Forward Silicon Tracker and Forward small-strip Thin Gap Chambers. The forward detector upgrade will have excellent detection capability for neutral pions, photons, electrons, jets, and hadrons. A combination of soft and hard probes collected during 2022-25 will be used to probe the QGP's microstructure and enable a unique forward physics program via the collection of high statistics Au+Au, p+Au, and pp data at $\sqrt{s_{NN}} = 200$ GeV. With the extended acceptance and the enhanced statistics, STAR will be positioned to perform correlation studies in heavy-ion collisions, e.g., the pseudorapidity dependence of azimuthal correlations and the pseudorapidity dependence of global hyperon polarization. The STAR forward detector upgrade will also enable an extensive suite of measurements probing the quark-gluon structure of heavy nuclei.

In this talk, we will present the current status of the forward detector system and discuss its performance during data taking with cosmic ray and pp collisions at $\sqrt{s_{NN}} = 510$ GeV.