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The STAR beam energy scan phase II physics and upgrades

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The second phase of the Beam Energy Scan at RHIC, BES-II, is scheduled for 2019-2020 and will explore with precision measurements the high baryon density region of the QCD phase diagram. The program will examine the energy region of interest from 7.7 to 19.6 GeV which is determined from the results of BES-I. Some of the key measurements anticipated are: the net-protons kurtosis that could pinpoint the position of a critical point, the directed flow that might prove a softening of the EOS, and the chiral restoration in the dilepton channel. The measurements will be possible with the order of magnitude better statistics provided by the electron cooling upgrade of RHIC and with the detector upgrades planned to extend STAR's experimental reach. The upgrades are: the inner TPC sectors (iTPC), the Event Plane Detector (EPD), and the end-cap TOF (eTOF).

We will present upgrade details both on detectors and collider in BES-II. The operation plan for BES-II will be shown. The physics opportunities enabled by these upgrades will be discussed.

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