

STAR endcap upgrade for eSTAR

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It's proposed that the Relativistic Heavy-Ion Collider (RHIC) will be upgraded to form an Electron-Ion Collider (EIC) in the coming decade. At the first stage, the existing two main detectors at RHIC - PHENIX and STAR - will be upgraded correspondingly to better conduct the physics program at an EIC (called ePHENIX and eSTAR). STAR, with outstanding detector power in its barrel part, will focus on the upgrade at the endcap region.

Several conceptual detectors have been proposed for the upgrade at the eSTAR endcap region, including an inner tracker with capability of detecting Cherenkov radiation, a transition radiation detector (TRD) based on GEM readout, an endcap time-of-flight (TOF) detector, and a forward electro-magnetic calorimeter (EMC). An upgrade of the inner-sector readout of the time projection chamber (iTPC) will also have impact on eSTAR. Preliminary R&D on these detector concepts have already begun. Simulation studies are undergoing to clarify their impacts on eSTAR physics and the requirements for the detectors. We will introduce the progress on the simulation part, especially for the TRD and iTPC. The status of crystal R&D for the forward EMC will also be given.

Keywords

eSTAR, upgrade, endcap, detector

Primary author: SHAO, Ming (Univ. of Sci. and Tech. of China)

Presenter: SHAO, Ming (Univ. of Sci. and Tech. of China)

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