

The STAR Event Plane Detector - An Upgrade for 2018+

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The first phase of the RHIC Beam Energy Scan program (BES-I) has revealed intriguing trends in observables as a function of collision energy in the region $\sqrt{s_{NN}} \sim 7 - 30$ GeV.

These include directed flow and global polarization measurements, which require an accurate determination of the first-order event plane. They also include measurement of higher-order moments of the net-proton distribution, which require an accurate determination of the collision centrality in a region well-separated from the zone of interest at midrapidity.

The next phase of the program, BES-II, will explore this region in greater detail, exploring additional collision energies, improving statistics, and implementing detector upgrades. The Event Plane Detector (EPD) is one such upgrade, providing high-segmentation charged-particle measurements at pseudorapidity $2 < |\eta| < 5$. This is expected to roughly double the first-order event plane resolution and provide a separation $\Delta\eta$

gtresim1 between the region used for centrality and that used to calculate the net-baryon moments, greatly reducing uncertainties from hadronic cross-talk.

The detector consists of two wheels, each composed of 372 tiles of scintillator read out by wavelength-shifting fibers optically coupled to silicon photomultipliers (SiPMs). I will discuss the detector design, as well as results from a prototype and a partial install of the full detector in RHIC runs 2016 and 2017, respectively. I will also discuss the production status of the full detector, scheduled for installation at the end of this year.

List of tracks

New methods and facilities

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