

Abstract Submitted  
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**The STAR Forward GEM Tracker** BERND SURROW, MIT, STAR COLLABORATION — The STAR collaboration is preparing a tracking detector upgrade, the Heavy Flavor Tracker (HFT) and the Forward GEM Tracker (FGT) to further investigate fundamental properties of the new state of strongly interacting matter produced in relativistic-heavy ion collisions at RHIC and to provide fundamental studies of the proton spin structure and dynamics in high-energy polarized proton-proton collisions at RHIC. The FGT will focus on novel spin physics measurements in high-energy polarized proton-proton collisions, determining the flavor dependence ( $\Delta\bar{u}$  versus  $\Delta\bar{d}$ ) of the polarized sea. These polarized parton distribution functions (PDFs) are only weakly constrained by polarized fixed target experiments, giving limited insight into the underlying mechanisms which produce the polarized sea. STAR plans to probe these PDFs using parity violating W production and decay. The production of  $W^{-(+)}$  bosons provides an ideal tool to study the spin-flavor structure of the proton.  $W^{-(+)}$  bosons are produced in  $\bar{u} + d$  ( $\bar{d} + u$ ) collisions and can be detected through their leptonic decays,  $e^- + \bar{\nu}_e$  ( $e^+ + \nu_e$ ), where only the respective charged lepton is measured. The sensitivity of those measurements is enhanced in the forward direction. The discrimination of  $\bar{u} + d$  ( $\bar{d} + u$ ) quark combinations requires distinguishing between high  $p_T$   $e^{-(+)}$  through their opposite charge sign, which in turn requires precise tracking information. An upgrade of the STAR forward tracking system is needed to provide the required tracking precision for charge sign discrimination. This upgrade will consist of six triple-GEM detectors with two dimensional readout arranged in disks along the beam axis. The FGT design, the performance of triple-GEM prototype detectors based on industrially produced GEM foils along with the status of the FGT construction and the anticipated installation schedule will be presented.

Tai Sakuma  
MIT

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