

# Forward sTGC Tracker Prototyping and Performance Test for the STAR Upgrade

Yingying Shi, for the STAR collaboration  
Shandong University

The STAR experiment at RHIC is undergoing an upgrade including a new Forward Tracking System (FTS), which consists of a Forward Silicon Tracker (FST) and a Forward sTGC Tracker (FTT). The small-strip Thin Gap Chambers (sTGC) at STAR are designed to provide a precision position measurement of about 100 $\mu$ m for charged particles at high luminosity, covering a rapidity region ( $2.5 < \eta < 4$ ). This extended rapidity coverage combining particle tracking detectors and calorimetry opens novel physics opportunities in pp, pA and AA collisions in the years following the Beam Energy Scan II (BES-II) at STAR.

Three different sTGC prototypes have been designed at Shandong University. The first pre-prototype has been installed at STAR in 2019 during the BES-II run. A full size prototype has been tested with cosmic rays at Shandong University. The latest prototype, a pentagon-shaped design, is being constructed in 2020. In this presentation, the R&D details on prototyping and performance testing of these prototypes will be presented. The current status and future plans of the FTT upgrade will be discussed.