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Quality Assurance and radiation tolerance tests of double-sided silicon sensors for the CBM Silicon Tracking System

The Silicon Tracking System (STS) is the main tracking detector of the upcoming fixed-target Compressed Baryonic Matter (CBM) experiment at FAIR which aims to explore the phase diagram of strongly interacting matter in the region of high net baryonic densities and moderate temperatures. The STS will be used for the reconstruction of tracks of charged particles and the determination of their momenta. The system comprises 8 tracking stations located between 30 cm and 100 cm downstream of the target. The detector will be equipped with approximately 1200 double-sided silicon microstrip sensors in different sizes. A high level of radiation damage is expected to impact on the sensors. Beyond the maximum exposure with 1×10^{14} per cm^2 in 1 MeV neutron equivalent that will be reached after several years of running depending on the physics program, the replacement of the sensors is planned. The Quality Assurance (QA) procedures for the STS sensors will be overviewed highlighting the automated QA testing procedure for single strip defect identification. In addition to this, the radiation tolerance studies performed on STS sensor prototypes will be presented.

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