Contribution ID: **253** Type: **Oral Presentation**

The Silicon Tracking System (STS) of the CBM experiment at FAIR

Monday 22 September 2025 18:00 (20 minutes)

The Compressed Baryonic Matter (CBM) experiment at the Facility for Antiproton and Ion Research (FAIR) aims to explore the phase diagram of strongly interacting matter at high baryon densities. It is designed to study heavy-ion collisions at beam energies of up to 11 AGeV using the SIS100 synchrotron. The CBM will explore collisions of high-intensity nuclear beams with thick fixed targets achieving high luminosity. Due to the extended beam extraction technique used at the SIS100 synchrotron, CBM data collection will be based on streaming time-stamped detector data into a super-computer. Event detection and physics analysis will be performed online at collision rates up to 10 MHz, demonstrating modern experiments' dynamic and real-time nature. The basic principles of the CBM experiment and its STS detector will be presented. In addition, in the following presentation, I will discuss step by step how the detector components are rigorously selected and prepared for assembly. This process involves a high level of precision and care to ensure the quality and reliability of the detector. It all starts with careful testing of the readout ASIC at the wafer level or in the manual process. The next step is to test the bonding to the micro cables and, later, the 16-chip cables that are bonded to the silicon strip sensor. All test results are stored and made available via a web interface for later use in a specially designed database using custom software applied to each assembly step. This custom software tests the quality and functionality of each detector part, ensures a seamless Q&A procedure, and stores data online from two assembly sites at GSI and KIT. More than 50 percent of the modules will be produced, and the overview will be made by the time of the presentation.

Author: KESHELASHVILI, Irakli (GSI Helmholtzzentrum für Schwerionenforschung GmbH)

Presenter: KESHELASHVILI, Irakli (GSI Helmholtzzentrum für Schwerionenforschung GmbH)

Session Classification: Accelerators and Instrumentation

Track Classification: Accelerators and Instrumentation