The Silicon Tracking System of the CBM experiment at FAIR

Johann M. Heuser, GSI Helmholtzzentrum für Schwerionenforschung GmbH – for the CBM Collaboration –

4th Helmholtz Matter and Technologies Meeting, Berlin, 12-14 June 2018

- CBM: world-record high-rate heavy-ion physics experiment
 - Compressed Baryonic Matter; up to 10⁷ beam-target interactions/s
 - in preparation by the international CBM Collaboration at FAIR-SIS100
- Silicon Tracking System STS: core CBM detector
 - identification of hundreds of charged particles per interaction
 - determination of their momenta in a dipole magnetic field



- STS technical developments are advanced, construction starting in 2019
 - double-sided silicon microstrip sensors

 (high spatial segmentation, radiation tolerance)
 - self-triggering read-out
 electronics
 (high time resolution, charge
 measurement, high data throughput)
 - module + ladder assembly
 (low mass, handling, yield)
 - system integration,
 system demonstrators
 (performance tests:
 S/N, resolution, rate capability)









- Germany, Russia, Poland are key STS contributors

 distributed production of components
- Helmholtz Centers play an important role:
 - **GSI:** * Project leadership, technical coordination
 - * STS system integration
 - * Detector Laboratory expertise + infrastructure
 - * demonstrator experiment miniCBM at SIS18
 - Jülich: in-beam component tests with extracted proton beam at COSY
 - **KIT:** module assembly center
 - DESY: coordination of EU-H2020 Project CREMLIN: WP3: Joint development of STS by GSI and JINR



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More at the posters:

🕂 P. Pfistner, KIT

Module assembly technologies for the Silicon Tracking System of the CBM experiment at FAIR

A. Rodriguez Rodriguez, Univ. Frankfurt
 The front-end electronics of the CBM
 Silicon Tracking System

 M. Dogan, GSI and Istanbul University
 STS-XYTERv2 and prototype FEB-B tests for the CBM Silicon Tracking System