# HK 6: Instrumentation II

Zeit: Montag 14:00–15:15 Raum: HZO 80

**Gruppenbericht** HK 6.1 Mo 14:00 HZO 80

**The CBM Time-of-Flight wall** — •Ingo Deppner and Norbert Herrmann for the CBM-Collaboration — Physikalisches Institut der Universität Heidelberg

The Compressed Baryonic Matter (CBM) experiment aims at exploring the QCD phase diagram at large baryon densities in the beam energy range from 2 A GeV to 11 (35) A GeV at the SIS100 (SIS300) accelerator of FAIR/GSI. For charged particle identification that is required by many observables that are sensitive to the phase structure like collective flow, phase space population of rare hyperons, fluctuations of conserved quantities, - a high performance Time-of-Flight (TOF) wall with a granularity of about 120.000 channels and a system timing resolution of better than 80 ps is being built. The most demanding challenge, however, is the enormous incident particle fluxes between 100 Hz/cm$^2$ and 25 kHz/cm$^2$ generated at the highest interaction rates (10 MHz) that CBM is designed for. Part of the wall ($\sim$10.000 channels) will be installed in the forward hemisphere ($1.0 < \eta < 1.5$) of the STAR experiment at RHIC/ BNL during the beam energy scan (BES II) campaign planned for 2019/2020. This project, called eTOF, is in the scope of the FAIR phase 0 program.
The status and the performance regarding time resolution, efficiency, cluster size and rate capability of the TOF system and in particular of the eTOF system as well as the physics reach will be discussed.
Work was supported partially by BMBF 05P12VHFC7 and by EU/FP7-HadronPhysics3/WP19.

HK 6.2 Mo 14:30 HZO 80

**Untersuchung von RPC-Auflösungen mit kosmischer Strahlung** — •Philipp Weidenkaff für die CBM-Kollaboration — Universität Heidelberg

Die Cbm-ToF Gruppe entwickelt und produziert RPC-Flugzeit-Detektoren für CBM und das eToF-Update des STAR-Experiments. Detektor-Tests mit kosmischer Strahlung sind ein wichtiger Schritt in der Qualitätskontrolle der Module für die 2018-2019 anstehenden System-Integrationstests in MiniCBM@SIS18 und STAR@RHIC. Mit Messungen kosmischer Strahlung wird das Verhalten der RPC-Detektoren in Bezug auf Zeitauflösung, Ortsauflösung und Effizienz bei minimalem Teilchenfluss bestimmt. In einer solchen sauberen Umgebung kann dass Detektor-Verhalten unabhängig von störendenden Einflüssen komplexer Reaktionen untersucht werden und bietet die Möglichkeit die Analyse-Software anhand von einfachen Ereignissen im Vergleich zu Monte-Carlo-Simulationen zu verifizieren.

HK 6.3 Mo 14:45 HZO 80

**Barrel Time-of-Flight Detector for the PANDA Experiment - Hardware Performance Validation - Update** — •Sebastian Zimmermann[1,2], Ken Suzuki[1], Kai-Thomas Brinkmann[2], Marius Chirita[1], Nicolaus Kratochwil[1], William Nalti[1], Lukas Gruber[1], Dominik Steinschaden[1], Albert Lehmann[3], Merlin Böhm[3], Carsten Schwarz[4], Herberth Orth[5], Kamal Dutta[6], and Kushal Kalita[6] for the PANDA-Collaboration — [1]Stefan-Meyer-Institut, Wien, Österreich — [2]JLU, Gießen — [3]FAU, Erlangen-Nürnberg — [4]GSI, Darmstadt — [5]HIM, Mainz — [6]Gauhati University, Assam, India

We describe the technical layout and the expected performance of the Barrel Time-of-Flight detector (*Barrel TOF*) for the PANDA target spectrometer, giving updates on recent developments. The Barrel TOF detector has been designed to precisely measure the time at which a charged particle transits the detector with a resolution superior to the other sub-detectors. It will signal the topology of physics events, hence setting cornerstones for event classification. The implementation of the Barrel TOF is based on very fast organic scintillator tiles coupled to Silicon Photomultipliers. In total 2000 scintillators and 16k SiPMs will be used, covering 5 m$^2$. The detector R&D is now in advanced stage and the technical design report is being reviewed by FAIR council.

The emphasis of this talk will be put on the updated design and performance of the PCB stripline transmission and fine scans of the time resolution of the detector elements, continuing the updates for the B-TOF detector.

HK 6.4 Mo 15:00 HZO 80

**Barrel Time-of-Flight Detector for the PANDA Experiment - Hardware Performance Validation - Update** — •Sebastian Zimmermann[1,2], Ken Suzuki[1], Kai-Thomas Brinkmann[2], Marius Chirita[1], Nicolaus Kratochwil[1], William Nalti[1], Lukas Gruber[1], Dominik Steinschaden[1], Albert Lehmann[3], Merlin Böhm[3], Carsten Schwarz[4], Herberth Orth[5], Kamal Dutta[6], and Kushal Kalita[6] for the PANDA-Collaboration — [1]Stefan-Meyer-Institut, Wien, Austria — [2]JLU, Gießen — [3]FAU, Erlangen-Nürnberg — [4]GSI, Darmstadt — [5]HIM, Mainz — [6]Gauhati University, Assam, India

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