Contribution ID: **26** Type: **Parallel Talk**

Track Reconstruction and Muon Identification in the Muon Detector of the CBM Experiment at FAIR

Monday 3 November 2008 17:00 (25 minutes)

The Compressed Baryonic Matter (CBM) experiment at the future FAIR accelerator at Darmstadt is being designed for a comprehensive measurement of hadron and lepton production in heavy-ion collisions from 8-45 AGeV beam energy, producing events with large track multiplicity and high hit density. The setup consists of several detectors, including the silicon tracking system (STS) placed in a dipole magnet close to the target region, and the MUCH (MUon CHamber) detector. The MUCH detector is aimed for muon identification down to momenta of 1.5 GeV/c. It consists of a sequence of absorber layers and detector stations. The concept for the MUCH detector and the status of the track reconstruction software are presented in this contribution.
The reconstruction software is organized to be flexible with respect to feasibility studies of different physics channels and to optimization of the detector itself. The main blocks of the reconstruction package include track finding, fitting and propagation in the material of the detector. The track finding algorithm is based on the track following method with branches, using tracks reconstructed in the STS as initial seeds. The magnetic field is taken into account during extrapolation through the detector. Track propagation in the material includes accurate calculation of multiple scattering and energy losses. The performance of the track propagation is shown to be similar to the results of GEANE. Track parameters and covariance matrices are estimated using the Kalman filter method. At the final competition, tracks with larger number of hits and with better chi-square value are more preferable.
The track reconstruction efficiency for muons embedded in central Au+Au collisions at 25 AGeV beam energy from the UrQMD model is at the level of 95%. In these collisions, feasibility studies of low mass vector meson measurements in the dimuon channel result in 1.7% total reconstruction efficiency of the omega meson and a signal to background ratio of 0.15. Currently, ongoing work focuses on detector layout studies in order to optimize the detector setup while keeping a high performance.

Primary author: Mr LEBEDEV, Andrey (GSI, Darmstadt / JINR, Dubna)

Co-authors: Dr KISELEVA, Anna (GSI, Darmstadt); Dr HOEHNE, Claudia (GSI, Darmstadt); Prof. OSOSKOV, Gennady (JINR, Dubna); Dr KISEL, Ivan (GSI, Darmstadt / KIP, University of Heidelberg)

Presenter: Mr LEBEDEV, Andrey (GSI, Darmstadt / JINR, Dubna)

Session Classification: Data Analysis - Algorithms and Tools

Track Classification: 2. Data Analysis