HK 53: Instrumentation und Anwendungen

Zeit: Donnerstag 17:00–18:00 Raum: F

HK 53.1 Do 17:00 F

Event reconstruction in the CBM silicon detector — •Sergey Gorbunov[1] and Ivan Kisel[2] for the CBM-Collaboration — [1]GSI, Darmstadt — [2]KIP, Universität Heidelberg

A full chain of event reconstruction algorithms has been developed for the main tracking detector of the CBM experiment at GSI, including pattern recognition, track fit in non-homogeneous magnetic field, reconstruction of event vertex and fit of decayed particles. The algorithms show excellent performance. They are optimized for the execution speed required in an on-line event selection filter.

HK 53.2 Do 17:15 F

Simulation and Event Reconstruction inside the PandaRoot Framework — •Stefano Spataro — II. Physikalisches Institut, Gießen, Germany

The PANDA detector will be located at the future GSI accelerator FAIR. Its primary objective is the investigation of strong interaction with anti-protons in the energy range up to 15 GeV.

The PANDA offline simulation framework is called “PandaRoot”, as it is based upon the ROOT 5.12 package. It is characterized by a high versatility; it allows to perform simulation and analysis, to run different event generators (EvtGen, Pluto, UrQmd), different transport models (Geant3, Geant4, Fluka) with the same code, thus to compare the results simply by changing few macro lines without recompiling at all. Moreover auto-configuration scripts allow installing the full framework easily in different Linux distributions and with different compilers (the framework was installed and tested in more than 10 Linux platforms) without further manipulation. The final data are in a tree format, easily accessible and readable through simple clicks on the root browsers.

The presentation will report on the actual status of the computing development inside the PandaRoot framework, in terms of detector implementation and event reconstruction.

This work was supported by BMBF 06 GI 144.

HK 53.3 Do 17:30 F

Fast Simulations für das PANDA-Experiment — •Klaus Götzen für die PANDA-Kollaboration — GSI, Planckstr. 1, 64291 Darmstadt

Eines der primären Experimente an der durch den Ausbau an der GSI enstehenden Facility for Antiproton and Ion Research (FAIR) stellt das PANDA-Experiment dar. Das vielfältige und reichhaltige projektierte Physikprogramm stellt hohe Anforderungen an das Design des PANDA-Detektors. Zur Optimierung und Abstimmung der einzelnen Detektorkomponenten ist daher eine verlässliche Simulation notwendig, mittels welcher sich auf kurzfristigen Zeitskalen verschiedene Design-Optionen untersuchen lassen sowie Aussagen über Rekonstruktionseffizienz und Akzeptanz entscheidender Physikkanäle (sogenannter Benchmark-Channels) treffen lassen. Vorgestellt werden Konzept und Technik der Fast Simulation für PANDA sowie einige Resultate zu Design-Studien.

HK 53.4 Do 17:45 F

Online Hough-Tracker for the Silicon Tracking System of the CBM experiment — •Christian Steinle, Andreas Kugel, Reinhard Männer, Holger Singpiel und Andreas Wurz für die CBM-Kollaboration — Lehrstuhl Informatik V, Universität Mannheim, Deutschland

The planned CBM fixed-target experiment produces up to 10ˆ7 nucleus-nucleus collisions per second, with multiplicities up to 1000 particles. This is the reason why we need a fast level-1 trigger.

We present an adaptation of the Hough transform for the tracking of particles in the CBM STS detector, together with a possible implementation of the algorithm in hardware using FPGA (field programmable gate array) as a fast level-1 trigger. In a first step we have used a track model based on an analytic formula for the Hough transform. By simulating this concept with central Au+Au data we have achieved reconstruction efficiencies of up to 90% with different geometries for the CBM STS detector. By using the Runge-Kutta method for the transformation we can improve the track model, especially in the representation of the inhomogeneous magnetic field, which will lead to a gain in the efficiency.

The processing time using FPGA processors is in the order of 10 to 100 μs, and is independent of the used track model.

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