Abstract Submitted
for the HAW09 Meeting of
The American Physical Society

Simulation on the Charged Particle Response of the STAR Heavy Flavor Tracker Pixel Detector ALEX CIMAROLI, XIN LI, Purdue University — The main task of the STAR experiment, located at the Relativistic Heavy Ion Collider at Brookhaven National Laboratory, is to study the quark-gluon plasma (QGP), which is believed to have been created a few microseconds after the "Big Bang." Heavy quarks are ideal tools for studying the properties of QGP. The Heavy Flavor Tracker (HFT) is the central part of the STAR future heavy flavor physics program and will enable STAR to directly measure heavy flavor mesons. The core of HFT is a pixel detector (PIXEL) using CMOS Active PIXEL Sensor. This poster will describe the development of a detailed simulation of the pixel detector response to charged particles and the corresponding fast simulation that dramatically enhances the simulation speed with little sacrifice in accuracy. The full simulation randomly generates ionized electrons along an incoming track and diffuses the electrons inside the pixel array until they are collected by the electronics or recombined inside a pixel. With the same result, the fast simulation, which quickens processing time from one hour to 5 seconds, generates a grid inside a single pixel and create a map of probability distribution functions for a single ionized electron generated from a grid point. We will also discuss the study of pixel detector position resolution using a simple clustering algorithm.

Abstract APS

Date submitted: 19 Aug 2009 Electronic form version 1.4