A precision device needs precise simulation:
Software description of the CBM Silicon Tracking System

Hanna Malygina, Volker Friese

Introduction:

- ▶ The CBM experiment is aimed at exploring the phase diagram of strongly-interacting matter in the region of high NET baryonic densities. The rich physical program requires high luminosity. There will be no hardware trigger.
- ▶ Silicon Tracking System — the core detector of the CBM. Layers of the STS are made of double-sided silicon strip sensors and self-triggered read-out electronics.
- ▶ Simulation and reconstruction software is required to be time-based.

Key messages:

- ▶ Detector response modelling includes all the physical processes occurring in a silicon detector as well as the read-out electronics simulation. The processes are: energy loss of an incident particle, drift of the created charge carriers in the electro-magnetic field, diffusion of the carriers, cross-talk due to capacitances.
- ▶ Choice of the algorithm for cluster position finding influences residuals;
- ▶ Proper estimate of the hit position error assures high tracking quality;
- ▶ High-speed algorithms are important for time-based cluster and hit reconstruction.