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The Reconstruction and Calibration of the BESIII Drift Chamber

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The BESIII detector will be commissioned at the upgraded Beijing Electron Positron Collider (BEPCII) at the end of 2007. The drift chamber(MDC), which is one of the most important sub-detectors of the BESIII detector, is expected to provide good momentum resolution (0.5%@1GeV/c) and tracking efficiency in a range of 0.1~2.0 GeV/c. This makes stringent demands on the performance of the offline software. The event reconstruction and offline calibration algorithms have been developed in BESIII Offline Software System (BOSS), using C++ language and object-oriented techniques.

The reconstruction consists of tracking and track fitting using Kalman filter method. The tracking uses a pattern matching method to find track segments and then combined into track candidates followed by a least square fit. The track fitting based on Kalman filter is used to handle effects of material and non-uniform magnetic field. The implementation of the tracking and the fitting algorithms and the performance with the Monte Carlo data will be presented.

The study of the offline calibration method using the cosmic ray data, including the calibration of the X-T relation and the software alignment, will be also presented.

Submitted on behalf of Collaboration (ex, BaBar, ATLAS)

BESIII

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