Alignment study of vertex detectors of the Belle II experiment

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This thesis is about the alignment of vertex semiconductor detectors of the Belle II experiment. It is divided into several sections. The first part introduces the Belle II experiment as a new generation B-factory, with its ambitious plans of data taking and physical analysis. The second part follows with a more detailed description of Belle II detector and software tools designed for their alignment and calibration. The central part of the thesis describes physical processes used for calibration of the vertex detector, connected with the search of an optimal solution for run-time monitoring and calibration of the detector. We also tested the effect of misalignment on the Belle II tracking software. The following part gives results of the study of misalignment effects on physical observables related to analysis of selected physical channels. The last part describes the development of a data quality monitoring tool for the tracking system. The tools has to provide a run-time diagnostic of misalignment and miscalibration by monitoring the precision and accuracy of reconstruction of physical observables.

Sekce

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