Expected performance of the ALICE Silicon Drift Detectors

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Abstract

Silicon Drift Detectors will be an essential component of the Inner Tracking System for the ALICE experiment at the LHC. During the past years, different prototypes were studied and tested, in order to define the optimal configuration. In parallel, a detailed simulation, based on an object-oriented approach in the framework of the Aliroot package, was developed: it includes steps corresponding to the drift and diffusion, front-end electronics, digitization, data compression, cluster finding. The code was validated by comparing its predictions to the results coming from the test beam data takings; then, it was used to evaluate the performance in terms of efficiency, resolution and double track separation, in the experimental conditions expected for ALICE.