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Particle Identification Detectors for the PANDA experiment at FAIR

The PANDA experiment at the planned FAIR facility at GSI, Darmstadt aims at measuring hadronic final states with unprecedented precision and luminosity. Superior particle identification of charged and neutral particles covering the full solid angle and momenta up to 15 GeV/c is mandatory to fulfill PANDA's physics aims to search inter alia for exotic charmed mesons and glueballs. Detectors for particle identification comprise apart from coarse measurements of the deposited energy in the tracking detectors, precision Time-Of-Flight detectors, electromagnetic calorimeters, muon chambers and last not least a sophisticated array of Cherenkov detectors based on the DIRC principle. The central detector will feature a barrel DIRC covering the central region and a novel disc DIRC providing particle identification capabilities in the important, high multiplicity, forward region. These detectors will be complemented by a more conventional RICH detector, Time-of-Flight and calorimeters in the far forward region. The presentation will detail the performance of the individual particle identification detectors and approaches to relating information of different detector towards a common performance. Special emphasis will be given to the main particle identification detectors, the barrel DIRC and the downstream endcap disc DIRC. The latter requires novel approaches to the construction of a DIRC detector which will be described in detail.

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