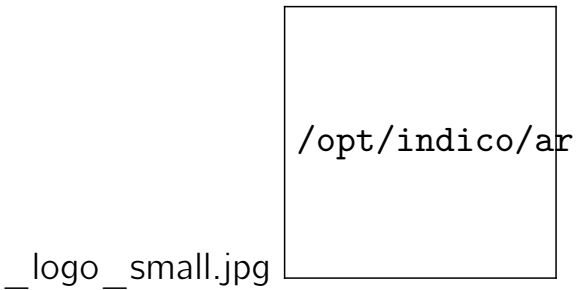

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The PANDA DIRC detectors at FAIR

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Content

The PANDA experiment at the FAIR facility will use antiproton beams on a fixed target to investigate open questions in hadron physics in the momentum range of 1.5-15 GeV/c. Two DIRC detectors in the target spectrometer will provide charged particle identification (PID) for pions and kaons. The Barrel DIRC covers polar angles between 22◦ and 140◦ and momenta between 0.5 GeV/c and 3.5 GeV/c. It is based on the successful BaBar DIRC detector, but with several key improvements to perform π/K separation better than 3σ. In the (forward) endcap region, for polar angles between 5◦ to 22◦, the Disc DIRC will cleanly separate π from K for momenta up to 4 GeV/c. Both DIRC counters will use lifetime-enhanced microchannel plate PMTs for photon detection in combination with fast readout electronics. The radiators are made from highly polished synthetic fused silica to minimize the loss of photons propagating through the radiators by total internal reflection and to ensure that the Cherenkov is conserved. Geant4 simulations and tests with several prototypes at various test beam facilities have been used to evaluate the designs and validate the expected PID performance of both PANDA DIRC counters.

Summary

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