

Development of DIRC counters for the PANDA Experiment at FAIR

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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 is mandatory to fulfil PANDA's physics aims. DIRC (Detection of Internally Reflected Cherenkov light) counters are foreseen for charged particle identification. A barrel DIRC will cover the central region while a disc DIRC will provide particle identification in the forward region.

Three DIRC concepts differing in the radiator geometry and method for dispersion correction are studied. The barrel DIRC uses a novel imaging system and aims at exploiting a 3D reconstruction to mitigate dispersion effects. Two concepts are investigated for the forward disc DIRC. One concept employs passive dispersion correction and focussing light guides for image reconstruction. Alternatively, time-of-propagation measurements and a wave-length dependent photon detection system are investigated.

The three designs are presented in detail. Results are shown on the common developments in terms of radiator material and quality, photon detection and read-out technology. The performance of each technology in the first test beams is discussed.

Summary (Additional text describing your work. Can be pasted here or give an URL to a PDF document):

http://nuclear.gla.ac.uk/~bseitz/VCI2010_pandaDIRC.pdf

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