

## PANDA Barrel DIRC design performance studies

The experiment PANDA, Antiproton Annihilation at Darmstadt, is designed to measure reactions induced by high intensity antiproton beams up to 15 GeV/c, at the Facility of Antiproton and Ion Research (FAIR), under construction at GSI, Darmstadt.

Being a fixed target experiment PANDA features a Target Spectrometer (TS) surrounding the interaction point and a Forward Spectrometer (FS) for the high momentum reaction products. Particle identification in the barrel region is of paramount importance and will be performed by means of detecting internally reflected Cherenkov light (DIRC), with a Barrel DIRC covering polar angles between  $22^\circ$  and  $140^\circ$ . Its primary purpose is the clean separation of pions and kaons ( $>3\sigma$ ), for momenta up to 3.5 GeV/c. The Barrel DIRC design, inspired by the concept successfully employed in the BaBar experiment, features significant novelties. Notably, at PANDA the Cherenkov photons are focused by a lens system onto an array of microchannel plate photomultipliers which are coupled to a compact expansion volume. The radiators, made of synthetic fused silica, extend over the full length of the barrel region while the width is subject to optimization, since a wide plate offers significant fabrication cost reduction. We describe the design of the PANDA Barrel DIRC and present decisive measurements performed with test beams at GSI and CERN in 2015, using both narrow and wide plate radiator geometries.

**Primary author:** Dr BELIAS, Anastasios (GSI - Helmholtzzentrum für Schwerionenforschung GmbH (DE))

**Presenter:** Dr BELIAS, Anastasios (GSI - Helmholtzzentrum für Schwerionenforschung GmbH (DE))

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