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The Focusing DIRC: an innovative PID detector

The FDIRC (Focusing Detector of Internally Reflected Cherenkov light) is a new concept of PID detector which aims at separating kaons from pions up to a few GeV/c. It is the successor of the BaBar DIRC and benefits from the knowledge accumulated with a first FDIRC prototype built and operated at SLAC.

The FDIRC is intended to be used at the SuperB experiment whose luminosity will be 100 times higher than for PEP-II and KEK-B. Backgrounds will be higher as well; yet, the FDIRC has been designed to perform at least as the DIRC. The main improvement is a complete redesign of the photon camera, moving from a huge tank of ultra-pure water to much smaller focusing cameras with sophisticated solid fused-silica optics. The BaBar camera was sensitive to background and its operation required constant attention.

The new cameras are instrumented with Hamamatsu H-8500 MaPMTs, readout by new front-end electronics. The detection chain will be 10 times faster than in BaBar, to reject more background and measure more accurately Cherenkov angles.

A full-scale FDIRC prototype has been successfully built at SLAC and will soon start taking cosmics data. The aim of this test is to validate the camera design, measure the Cherenkov angle resolution, test the electronics and validate the FDIRC simulation.

In this talk, we summarize the FDIRC design, present the status of the prototype test at SLAC and review all activities ongoing in the various labs participating to the development of the FDIRC.

quote your primary experiment

SuperB, BaBar

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