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The CLAS12 RICH detector

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The RICH detector of the CLAS12 experiment at Jefferson Lab has been designated to separate kaons from pions and protons in the momentum range between 3 and 8 GeV/c.

The detector geometry is based on an innovative hybrid optics design, with Cherenkov photons that can be detected either directly or after one or more reflections on a mirror system.

Its main components are: i) high transparency, large dimension blocks of aerogel radiator with refractive index n=1.05; ii) planar mirrors made by thin glass skins, never used before in nuclear physics; iii) light carbon fiber spherical mirrors; iv) large-area multianode photomultipliers for the photon detection with modular binary readout.

The detector is composed by two identical modules positioned in CLAS12 at opposite polar angles.

The first module has been installed in January 2018, just on time for the beginning of the CLAS12 data taking with the new 12 GeV energy beam.

The second module has been completed in June 2022, when the data taking with polarized targets has been started.

In this presentation we will discuss the status of the detector after several years of operation.

We will discuss the monitoring tools, the calibration and alignment procedures, the reconstruction and particle identification algorithms.

Finally, we will show select example of physics results demonstrating the PID performance of the detector.

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