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Silicon photomultiplier as a position sensitive detector of Cherenkov photons

A novel photon detector, silicon photomultiplier, whose main advantage over photomultiplier tubes is the operation in high magnetic field environments, has been tested in view of measuring Cherenkov photons in a RICH counter. The results of the measurement of single photo-electron pulse height and timing distribution, uniformity of the response and photon detector efficiency will be presented. An array of SiPMs was used as a position sensitive detector for Cherenkov photons. We will discuss the first results of the measurements with such an array. To increase the detection efficiency various light guides were investigated. Finally, we will discuss the design optimization of a proximity focusing RICH detector with silica aerogel as the radiator and an array of SiPMs as the photon detector.

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