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Aerogel RICH for Belle II

For the Belle-II experiment, we have been developing a proximity focusing RICH counter with silica aerogel radiator as a new particle identifier in the forward endcap region to reach a π/K separation capability corresponding to 4 sigma at 4 GeV/c. We have developed a novel radiator concept, a multilayer stack of radiator tiles with increasing refractive index in a focusing configuration. The central issue is, however, to develop a reliable single photon detector which can be operated at 1.5 T, has a sufficiently fine granularity and compact size. To fulfill these conditions, R&D on a new hybrid avalanche photo-detector (HAPD) has been conducted with Hamamatsu for several years. We have studied the device on the bench, and in beam tests, and have shown that it can be successfully operated in an axial magnetic field of 1.5 Tesla.

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