

High-quality aerogel Cherenkov radiators recently developed at Chiba

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Japan's KEK laboratory started developing silica aerogels as a Cherenkov radiator around 1980. The high-energy physics group at Chiba University began aerogel R&D 15 years ago, collaborating with KEK. Improving aerogel transparency enables the design of state-of-the-art ring-imaging Cherenkov (RICH) detectors. This study was first motivated by the radiator R&D for the Belle II Aerogel RICH (ARICH) detector. The technology was later transferred to the HELIX RICH and EMPHATIC ARICH detectors. In parallel, ultrahigh- and ultralow-refractive-index aerogels were developed for filling the gap in available indices for the identifications of low- and high-momentum particles, respectively. These were and will be employed in the ongoing and future hadron experiments in Japan and for the EMPHATIC beam identification counters at Fermilab and the NASA HELIX balloon payload in Antarctica. We report the latest results from the aerogel R&D and ongoing applications to threshold-type and RICH counters.

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