



Contribution ID: 116

Type: Poster

Recent Progress in the Development of Large Area Silica Aerogel for Use as RICH Radiator in the Belle II Experiment

This paper presents recent progress in the development and mass production of large area hydrophobic silica aerogels for use as a radiator in the aerogel-based ring-imaging Cherenkov (A-RICH) counter that will be installed in the forward end cap of the Belle II detector under upgrade at KEK, Japan. The proximity-focusing A-RICH system is especially designed to identify charged pions and kaons by the use of aerogel Cherenkov radiators with refractive indices of 1.045 and 1.055 and to have a separation capability of greater than 4σ at momenta up to 4 GeV/c. We plan to fill the large end-cap region of 3.5 m^2 with 124 segmented dual-layer-focusing aerogel combinations (248 tiles in total). It is crucial to minimize the number of aerogel tiles (i.e., to maximize the aerogel dimensions) to reduce tile boundaries, because the number of detected photoelectrons decreases at the boundaries. Therefore, we have developed a method for producing $18 \times 18 \times 2 \text{ cm}^3$ large area, transparent aerogels with no cracking. Prepared aerogel tiles will be trimmed in fan shapes according to the cylindrical end cap with a water jet cutter, making the best use of the hydrophobic features. Mass production was started in September 2013 and is going on track. Here we report the status of optical characterization of mass-produced aerogels in addition to the results of a beam test with a prototype A-RICH counter conducted at DESY, Germany in advance of mass production.

Author: Dr TABATA, Makoto (Japan Aerospace Exploration Agency (JAXA))

Co-authors: Prof. KAWAI, Hideyuki (Chiba University); Prof. ADACHI, Ichiro (High Energy Accelerator Research Organization (KEK)); Prof. NISHIDA, Shohei (High Energy Accelerator Research Organization (KEK)); Prof. SUMIYOSHI, Takayuki (Tokyo Metropolitan University)

Presenter: Dr TABATA, Makoto (Japan Aerospace Exploration Agency (JAXA))

Track Classification: Sensors: 1e) Novel technologies