



Contribution ID: 105

Type: **Talk**

## Developing hydrophobic silica aerogels for Cherenkov detectors

*Friday, September 19, 2025 11:20 AM (20 minutes)*

The latest research results on developing hydrophobic silica aerogel as a Cherenkov radiator are reported. Previously, our benchmark for the aerogel's optical property was a transmission length of 40 mm at a 400-nm wavelength for a refractive index of 1.05. The maximum size of a single tile with no mechanical cracking was 18 cm × 18 cm × 2 cm while ensuring hydrophobic quality. These characteristics were obtained during the construction of an aerogel-based RICH (ARICH) detector for the Belle II experiment being performed at KEK, Japan. We have recently been focusing on increasing the volume of a single aerogel tile in terms of area and thickness (e.g., 20 cm × 20 cm × 3 cm and beyond). Larger tiles enable us to construct a boundary-reduced radiator module for large detector systems. The key to producing a large tile with no internal cracking is a drying technology to extract solvents from a synthesized alcogel. Moreover, improving the optical transparency is crucial for utilizing aerogels with lower refractive indices in RICH detectors (e.g., ranging from 1.025 to 1.04), given the limited number of Cherenkov photons emitted in low-index aerogels. Specific applications of the above aerogels in planned worldwide high-energy physics experiments are also discussed.

**Author:** Dr TABATA, Makoto (Chiba University)

**Presenter:** Dr TABATA, Makoto (Chiba University)

**Session Classification:** Technological aspects and applications of Cherenkov light detectors

**Track Classification:** Technological aspects and applications of Cherenkov light detectors