

Calibration of Aerogel Tiles for the RICH of the HELIX Experiment

Friday 16 July 2021 19:18 (12 minutes)

HELIX (High Energy Light Isotope eXperiment) is a balloon-borne instrument designed to measure the chemical and isotopic abundances of light cosmic-ray nuclei. In particular, HELIX is optimized to measure ^{10}Be and ^9Be in the range 0.2 GeV/n to beyond 3 GeV/n. To achieve this, HELIX utilizes a 1 Tesla superconducting magnet with a high-resolution gas drift tracking system, time-of-flight detector, and a ring-imaging Cherenkov (RICH) detector. The RICH detector consists of aerogel tile radiators (refractive index ~ 1.15) with a silicon photomultiplier detector plane. To adequately discriminate between ^{10}Be and ^9Be isotopes, the refractive index of the aerogel tiles must be known to a precision of 0.1%. In this contribution, detailed mapping of the refractive index across the aerogel tiles is presented and the methodology used to obtain these measurements is discussed.

Keywords

cosmic ray; RICH; aerogel; Calibration; balloon

Collaboration

other (fill field below)

other Collaboration

HELIX

Subcategory

Experimental Methods & Instrumentation

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Session Classification: Discussion

Track Classification: Scientific Field: CRD | Cosmic Ray Direct