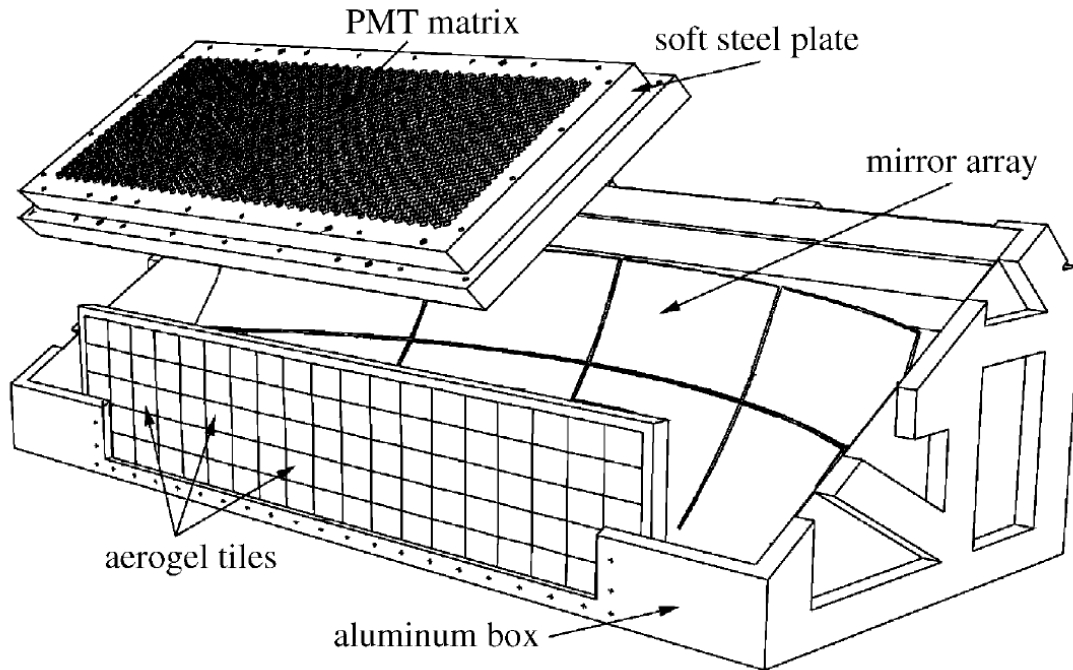


HERMES dual-RICH

Essential informations

Date: 28/Feb/2022

Made of two halves; TOP half in figure



Body of the detector is Aluminum.

Volume of single half is approx. 4000 liters

Inner walls are blackened

Entry window: 1 mm-thick Aluminum, area $1877 \times 464 \text{ mm}^2$

Exit window: 1 mm-thick Aluminum, area $2570 \times 590 \text{ mm}^2$

Aerogel wall: 425 tiles. Single Tile dimensions $114 \times 114 \times 11.3 \text{ mm}^3$, stacked in 5 rows x 17 columns, 5 tiles deep. Thin opaque black tedlar spacers between tiles absorb photons

crossing track boundaries. The aerogel container is sealed gas tight, dry nitrogen is continuously circulated.

UVT-Lucite: 3.2 mm-thick UVT-Lucite aerogel exit window seals aerogel from RICH gas volume and absorbs UV photons, yield of which from aerogel is dominated by Rayleigh scattering.

Gas system: recirculating C₄F₁₀ at slight overpressure with respect to atmosphere.

Spherical mirror: Array (2524 x 794 cm², weight <13 kg) made of 8 mirror segments (graphite fiber composite coated with epoxy film); segments are held on a carbon-fiber frame with individual adjustable three point mounts

Radius of curvature of 2.2 m and common sphere center.

Photosensors: 1934 XP1911UV PMTs. 0.75" diameter (15 mm minimum active photocathode diameter) on a soft steel structure. Soft steel structure and thin quartz windows seals individual PMTs from the C₄F₁₀ gas volume

LED system in principle used to test/calibrate PMTs on the mirror surface (never really used as far as know)

TOP half is at JLab, refurbished for the SBS SIDIS Experiment