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Reflectivity studies and production of new flat mirrors for the Cherenkov threshold detector at CERN

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Cherenkov threshold detectors (XCET) are used for identifying particles in the experimental areas at CERN. These detectors observe Cherenkov light emitted by charged particles travelling inside a pressurized gas vessel. A key component of the XCET detector is the 45-degree flat mirror reflecting the Cherenkov light towards the photomultiplier (PMT). A thorough analysis and optimization was conducted on the design and materials of this mirror, along with the surface coatings and coating techniques. A suitable manufacturing process was selected, and the first mirror prototype was produced, installed, and tested in the East Area at CERN. Experimental data obtained during beam tests is presented to assess the efficiency of the new coating and materials used.

Footnotes

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Europe

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