# A cellular honeycomb proportional counter design for ALICE Photon Multiplicity Detector

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**Abstract**

The Photon Multiplicity Detector (PMD) is a preshower detector to be used in the ALICE experiment at LHC to measure photon multiplicity and give estimates of transverse electromagnetic energy. The detector consists of a regular array of hexagonal cells. Each cell acts like a proportional counter with the cell wall as cathode and a wire passing through the axis as anode. Extensive simulations were done in order to optimize the cell design. Based on them, an extended cathode layout for the cells was accepted. A 96 cell prototype was fabricated and tested at CERN PS using 70:30 Ar + CO2 gas mixture and GASSIPLEX readout. The detector was subjected to hadron and electron beams of varying energies in order to study the single cell and preshower characteristics. The charged particle detection efficiency was found to be high, about 97 % and is quite uniform throughout the cell. The charged particle signal is confined to almost one cell as required by the design. The transverse spread of the preshower is found to be close to that given by GEANT simulations.

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