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A new graphene-based RPC fully built with additive manufacturing

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Additive manufacturing is a popular technique currently providing new opportunities in several domains. In this proposed work, we applied the above-mentioned technology to detector construction. We had hypothesized that a fully automated 3D printing of a detector would be ideal to drastically reduce: 1) detector construction cost and assembly time 2) the probability of mistakes during construction.

We introduced and optimized a new electrode material to match the properties of the existing Bakelite featured in RPC detectors installed in LHC experiments. The new material we present is extruded in a filament form, readily usable by any general-purpose desktop 3D printers.

By using our custom-made filament, we developed and printed several detector prototypes. Preliminary results, under cosmic rays regime, are going to be presented to demonstrate the proof-of-concept of this new RPC fully built with additive manufacturing.

Collaboration

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