

A novel polystyrene based plastic scintillator production process involving additive manufacturing

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The plastic scintillator detectors are widely used in high-energy physics, in particular in neutrino experiments. They can provide very good particle identification, sub-nanosecond time resolutions, full 3D geometrical acceptance and particle tracking and, at the same time, enough neutrino target mass to minimise the statistical uncertainties. In order to improve the knowledge of neutrino interactions, for instance particularly important for precision measurement of the CP violating phase, future neutrino experiments will require detectors with improved performances and fine granularity, whilst preserving a mass of many tons. The solution is using additive manufacturing, able to quickly make plastic-based objects of any shape with precisions better than 0.1 mm. The applicability of 3D-printing techniques to the manufacture of polystyrene-based scintillator will be discussed. The status of the R&D and the latest results will be presented.

Working group

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