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Liquid Scintillator Time Projection Chamber

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Results are presented from a small-scale experiment to investigate the use of room temperature organic liquid scintillators as the active medium for a time projection chamber (TPC).

The optical properties of liquid scintillators have long been known, but their ability to transport charge has remained, until now, largely untested. The idea of using room temperature liquids as an active medium for an ionisation chamber was first presented in [1]. Since then the range of liquid scintillators available has been greatly developed.

A selection of organic liquid scintillator cocktails have been tested, and it has been shown that charge can be transported over at least 20mm using an electric field of 0.5kVcmˆ{-1} in the liquid scintillator Di-isopropyl napthalene (DIN).

Forthcoming measurements include the drift speed and length in these media, energy spectra, quenching factors, with a view to particle tracking.

[1] R. A. Holroyd, D. F. Anderson, Nucl. Instr. Meth. A 236 (1985) 294-299

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