

MEASUREMENT WITH A TWO PHASE XENON PROTOTYPE DARK MATTER DETECTOR.

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The two phase Xe detector principle promises much enhanced background rejection compared with inorganic scintillator dark matter detectors. Scintillation signals from the liquid phase and electro luminescence amplification of the primary ionisation in the gas phase after electron drift are expected.

First measurements from a two-phase 3 kg Xe prototype cell have been taken. Signals have been observed from a variety of radiation sources and results characterised as a function of applied electric field. Electron drift times in excess of 60 ns have been measured. Signals have been observed from both liquid and gas phases. The two-phase output from alpha particles and gamma photons are presented.

Further experiments on the response to neutrons, simulating dark matter interactions, are discussed, emphasising the primary ionisation component. Prospects for the fabrication of a 9 kg two-phase detector by the UK Dark Matter Collaboration are mentioned.