

System of Analogue Modules for Data Acquisition from Two-Phase Xenon Detector.

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Abstract

A system of multichannel analogue modules for the prototype of a two-phase (liquid/gas) xenon detector for Dark Matter search is described. It consists of a low-noise fast preamplifier, an analogue sum unit and a trigger unit for the use in acquisition of data coming from the PMT's. It is used for signal amplification, shaping, summing, analogue selection and outputting signal to digitisers. An eight-channel preamplifier provides the necessary amplification of the PMT's anode signals with minimal distortion of the pulse shape and low noise. The analogue sum unit performs the summing of the pulses coming from the selected pairs of PMTs for subsequent digitisation them by a 4-channel DSO and also produces the pulses for QDCs and for the trigger unit. The trigger unit discriminates signals by amplitude and selects the useful events using different algorithms: logic "or", majority coincidence with two threshold levels and their combinations, generates grant signals for the QDCs and also sets them on the CAMAC bus. Modes and threshold levels of the trigger unit are also set by the CAMAC bus.