

Abstract Submitted
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Measuring the Timing Resolution of a Fine-Mesh PMT Under High Magnetic Fields¹ ARUN SELVARATNAM, GWU, VITALY BATURIN, Jefferson Lab — The upgraded particle accelerator in Jefferson Lab requires that the detectors in Hall B also be upgraded, so they may cope with its increased power. The CLAS12 Central Time-of-Flight detector will use a new barrel scintillation detector that will be exposed to high magnetic fields ranging up to 5 Tesla. Traditionally, linear focused photomultiplier tubes have been used to determine time-of-flight valuations for charged particles resulting from particle accelerator experiments. However, without heavy shielding, a linear focused PMT will not be able to function in a high magnetic field. A new breed of “fine-mesh” PMTs claim to be unaffected by magnetic fields ranging up to 0.8 to 1.2 T. Our setup consists of a fine-mesh PMT that will receive diffused LED light while different magnetic fields are pointed towards it. The light will travel through wavelength-shifting fiber optic cables to a reference linear focused PMT located outside the magnetic field. Prior studies have only been done with a point-like light source on the PMT within the field. We will find what effects high magnetic fields have on fine-mesh PMTs.

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