

Abstract Submitted
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Unexpected background signature seen by Gas Cherenkov Detector with Pulse Dilation - PMT at National Ignition Facility HERMANN GEPPERT-KLEINRATH, YONGHO KIM, KEVIN D. MEANEY, HANS W. HERRMANN, Los Alamos National Laboratory, JORGE A. CARRERA, EDIE F. MARISCAL, Lawrence Livermore National Laboratory, MICHAEL S. RUBERY, Atomic Weapons Establishment — The Cherenkov mechanism used in Gas Cherenkov Detectors (GCD) is exceptionally fast. The temporal resolution of GCDs, however, has been limited to ~ 100 ps by the current state-of-the-art photomultiplier tube (PMT) technology. The novel Pulse Dilation Photomultiplier Tube (PD-PMT) has a temporal resolution of ~ 10 ps, comparable to that of the gas cell. At 8 MeV threshold GCD measures DT fusion gammas and therefore directly the fusion reaction rate. High frequency features in the DT reaction history are visible that can improve the understanding of inertial confinement fusion. Background corrupting the DT signal was investigated and counter-measures implemented. The thorough investigation of background sources will inform future high sensitivity detector designs.

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