



Contribution ID: 65

Type: **Poster**

Application of Pixelated Liquid Argon Time Projection Chambers to Nuclear Medicine

Single Photon Emission Computed Tomography (SPECT) scanners detect gamma rays resulting from tracer chemicals like fluorine-18. These gamma rays have been detected in a pixelated Liquid Argon Time Projection Chamber (LArTPC) optimized for neutrino physics studies. These tests have in part motivated the optimization and design of a LArTPC for application in SPECT. This talk will present simulations of and designs for the SPECT Acquisition Using Liquid Argon (SPECTAcULAR) test stand at Fermi National Accelerator Laboratory.

Simulation studies have been performed in order to optimize parameters relevant to medical imaging. This talk will discuss the details of those simulation studies and how the results have motivated the design and construction of nuclear imaging scanners that use liquid argon technology. In addition to the simulation, this talk will provide an overview of the hardware efforts and plans for the SPECTAcULAR test stand at Fermilab.

If these tests are successful, they will demonstrate an ability to perform bio-medical scans with liquid argon time projection chambers. The simulations suggest this technology could provide enhanced spatial resolution over traditional technology. If true, this could have clinical implications such as lowering scan time, radiation dosage, or increasing image quality which would ultimately diagnostic capabilities and improve patient outcome.

Primary author: MURPHY, Thomas (Fermilab)

Presenter: MURPHY, Thomas (Fermilab)