

Abstract Submitted
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Building a Class-1 Glove Box for Use with the NIFFTE TPC

WILLIAM LYNN, Abilene Christian University, NIFFTE COLLABORATION — The Neutron Induced Fission Fragment Tracking Experiment (NIFFTE) uses a Time Projection Chamber (TPC) to measure the neutron-induced fission cross sections of actinides with unprecedented accuracy which will aid in the development of the next generation nuclear reactors. Charged particles, including fission fragments, create a trail of electrons within a fill gas through ionization, which then drift in an electric field towards the read-out electronics. Using a MicroMegas mesh, the signal is amplified and then detected by the TPC pad plane. Due to the delicate nature of the MicroMegas mesh, precaution must be taken to prevent damage to the mesh from airborne contaminants which can cause the mesh to short. To avoid radiological contamination, a glove box was chosen for the task of handling and installing actinide targets into the TPC. To protect the TPC electronics, a decision was made to modify the existing glove box to create a Class-1 cleanroom environment. Variables such as glove type, filter, and cleaning agent were tested independently to determine maximum cleanliness, and a procedure for creating an acceptable Class-1 environment inside the glove box for the TPC was developed.

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