

Abstract Submitted
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Detecting special nuclear material using a neutron time projection chamber G. CAROSI, A. BERNSTEIN, N. BOWDEN, J. BURKE, D. CARTER, LLNL, M. FOXE, Purdue University, M. HEFFNER, LLNL, I. JOVANOVIĆ, J. MINTZ, Purdue University, P. O'MALLEY, Rutgers University — Time projection chambers are 3-dimensional charged particle cameras based on drifting ionization tracks at a known velocity onto an electronic readout plane. These instruments are capable of detecting fast neutrons which are unique signatures of special nuclear material with low natural background rates. Here we describe a neutron Time Projection Chamber (nTPC) developed at Lawrence Livermore National Laboratory (LLNL) which has demonstrated directional sensitivity to fission neutrons along with high rejection of background gamma-ray and electron events. Using a combination hydrogen/methane drift gas at several atmospheres we've demonstrated the ability to point to a Cf-252 source simulating 6kg of weapons grade plutonium at 10's of meters with one hour integration time. Plans for future field deployable devices will also be outlined.

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