

Abstract Submitted
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Track Reconstruction for the NIFFTE TPC SARVAGYA SHARMA

— The Global Nuclear Energy Partnership (GNEP) has funded the construction of a Time Projection Chamber (TPC) to be used for precision fission cross-section measurements through the Nuclear Energy Research Initiative (NERI). This poster shall illustrate the status of algorithms intended for intelligent track finding and track fitting using raw data obtained TPC simulations. The track fitting effort in this experiment has borrowed a number of ideas from high-energy physics along with other pattern recognition techniques not previously affiliated with experimental physics. Two track-finding techniques have been investigated. The Hough Transform is a brute force attempt at finding tracks. The second paradigm for track reconstruction, Binary Space Partitioning (BSP) was found to be less computationally expensive than the Hough Transform. BSP has been borrowed from the field of computer animation and rendering. To determine track fit parameters, an iterative Kalman Filter has been implemented that allows multiple scattering and energy losses to be taken into account to obtain unbiased errors. Fitted tracks obtained from the Kalman Filter were used to generate the best kinematic fit on the vertex.

Sarvagya Sharma

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