

Abstract Submitted
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Reconstruction of $^{16}\text{O}(\gamma, \alpha)^{12}\text{C}$ Events in the HI γ S Optical Readout Time Projection Chamber S. STAVE, M.W. AHMED, E.R. CLINTON, C.R. HOWELL, P.-N. SEO, H.R. WELLER, TUNL, M. GAI, A.H. YOUNG, U. Conn., B. BROMBERGER, V. DANGENDORF, K. TITTELMEIER, PTB, Braunschweig — A new optical readout time projection chamber (O-TPC) is in use at the High Intensity γ -ray Source (HI γ S) located at the Free Electron Laser Laboratory on the Duke University campus. One application of the HI γ S O-TPC is the study of the inverse of the $^{12}\text{C}(\alpha, \gamma)^{16}\text{O}$ reaction which is important for stellar evolution theory. In the O-TPC, incoming γ -rays interact with an ^{16}O nucleus producing an α and a ^{12}C which then leave trails of ionization electrons along their path. The O-TPC then provides several signals each of which must be interpreted simultaneously to determine the different particle types, their energies and their directions. Part of the challenge of operating the O-TPC is integrating the fast signals from the photomultiplier tubes and drift chamber with the slow signals from the CCD camera which images the tracks. Automated routines have been developed to take all of the available track information and provide a reliable determination of the interaction cross section. Examples of the method and preliminary results will be presented.

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