^{3}He reaction histories on OMEGA

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Probing kinetic and multi-ion-fluid effects in ICF implosions using DT and D[1] H.W. SIO, J.A. FRENJE, M. GATU JOHNSON, C.K. LI, R.D. PETRASSO, MIT, J. KATZ, C. STOECKL, LLE, T. KWAN, A. LE, LANL, C. BELLEI, Centre Laser Intenses et Applications — To explore kinetic and multi-ion-fluid effects in D^{3}He-gas-filled shock-driven implosions (with a trace amount of T_2), D^{3}He and DT reaction histories were measured using the upgraded Particle X-ray Temporal Diagnostic (PXTD) on OMEGA. The relative timing between the D^{3}He and DT reaction histories was measured with 10-ps precision. The initial gas-fill density of the thin-glass targets was varied from 0.3 – 2.2 mg/cc, spanning highly-kinetic to more hydrodynamic-like plasma conditions during shock burn. Multi-ion-fluid simulations of similar implosions show reaction histories that are quantitatively different than those from average-ion-fluid simulations, including differences in burn onset, burn width, and relative bang-time. The measured differences between the reaction histories will be contrasted to average-ion-fluid hydrodynamic simulations, as well as multi-ion-fluid and kinetic-ion simulations, using LSP.

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