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The MIT HEDP Accelerator Facility for Diagnostic Development for OMEGA, Z, and the NIF[1] C.E. PARKER, M. GATU JOHNSON, A. BIRKEL, N.V. KABADI, B. LAHMANN, L.M. MILANESE, R.A. SIMPSON, H. SIO, G.D. SUTCLIFFE, C. WINK, J.A. FRENJE, C.K. LI, F.H. SEGUIN, R.D. PETRASSO, MIT, R. LEEPER, LANL, C.L. RUIZ, SNL, T.C. SANGSTER, LLE
— The MIT HEDP Accelerator Facility utilizes a 135-keV linear electrostatic ion accelerator, DT and DD neutron sources, and two x-ray sources for development and characterization of nuclear diagnostics for OMEGA, Z, and the NIF. The accelerator generates DD and D^3He fusion products through the acceleration of D^+ ions onto a ^{3}He-doped Erbium-Deuteride target. Accurately characterized fusion product rates of around 10^6 s^{-1} are routinely achieved. The DT and DD neutron sources generate up to $6x10^8$, and $1x10^7$ neutrons/s, respectively. One x-ray generator is a thick-target W source with a peak energy of 225 keV and a maximum dose rate of 12 Gy/min; the other uses Cu, Mo, or Ti elemental tubes to generate x-rays with a maximum energy of 40 keV. Diagnostics developed and calibrated at this facility include CR-39-based charged-particle spectrometers, neutron detectors, and the particle Time-Of-Flight (pTOF) and Magnetic PTOF CVD-diamond-based bang time detectors. The accelerator is also a valuable hands-on tool for graduate and undergraduate education at MIT.

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