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The magPTOF diagnostic for shock-bang and compression-bang time measurement and charged-particles spectroscopy at the NIF[1] H.W. HAN, H. SIO, H. RINDERKNECHT, J. FRENJE, A. ZYLSTRA, M. GATU JOHNSON, F. SEGUIN, C. LI, R. PETRASSO, MIT, A. HOUSE, J.R. RYGG, J. KIMBROUGH, A. MACPHEE, G.W. COLLINS, A. MACKINNON, S. LE PAPE, L. BERZAK HOPKINS, LLNL, M. BEDZYK, J. MAGOON, M. SHOUP, C. SANGSTER, LLE, J. KILKENNY, GA, R. OLSON, LANL — A magnetic particle-time-of-flight (MagPTOF) diagnostic has been fielded at the National Ignition Facility (NIF) for measurements of both shock- and compression-bang times. This type of measurement, combined with the measured shock-burn-weighted ρR, is used to understand shock convergence and implosion dynamics. The MagPTOF design is an upgrade to the existing particle time-of-flight (pTOF) diagnostic, which has recorded bang times in cryogenic DT implosions, DT exploding pushers and D3He implosions with accuracy better than 70 ps. The inclusion of a deflecting magnet should increase proton signal-to-background by a factor of 1000, allowing for measurements of shock bang time (using 14.7 MeV D3He protons) and compression bang time (using 2.45 MeV DD neutrons) in D3He-filled surrogate implosions. For exploding pushers with D3He, D2, T3He, or DT fuel, from which several charged fusion products escape, CR39 surrounding the CVD diamond detector can also be used for low-energy charged-particle spectroscopy. Implementation and initial data at the NIF will be discussed.

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