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Overview of the MARBLE Mix and Burn Campaign at the National Ignition Facility[1] B. J. ALBRIGHT, T. J. MURPHY, M. R. DOUGLAS, T. CARDENAS, J. H. COOLEY, T. H. DAY, C. DISTEFANO, L. GOODWIN, R. A. GORE, M. A. GUNDERSON, J. R. HAACK, B. M. HAINES, C. E. HAMILTON, Y. KIM, P. M. KOZLOWSKI, L. KUETTNER, M. N. LEE, J. A. OERTEL, R. E. OLSON, B. PATTERSON, R. B. RANDOLPH, J. M. SMIDT, C. WILSON, L. YIN, LANL, R. C. SHAH, LLE — MARBLE is a separated reactants campaign to investigate the effects of heterogeneous mix on thermonuclear burn. In MARBLE experiments, a two-shock implosion compresses Si-doped plastic capsules filled with fully deuterated divinylbenzene foam and HT or ArT gas fills. Embedded in the foam are engineered voids of known sizes and locations, which allow for control over heterogeneity prior to hydrodynamic mixing. The ratio of DT to DD neutron yield is measured, from which properties of the mix can be deduced. The MARBLE team successfully demonstrated for the first time control over heterogeneity and quantitatively assessed effects of mix on thermonuclear burn. These data enable validation of mix & burn models in multi-physics codes such as the LANL xRAGE code.

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