Thank you!!

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Ignition and Thermonuclear Burn on the National Ignition Facility with Imposed Magnetic Fields[1] L. JOHN PERKINS, B.G. LOGAN, M.A. RHODES, G.B. ZIMMERMAN, D.D. HO, D.T. BLACKFIELD, S.A. HAWKINS, Lawrence Livermore National Laboratory — We are studying the impact of highly compressed magnetic fields on enhancing the prospects for ignition and burn on the National Ignition Facility (NIF). Both magnetized room-temperature DT gas targets and cryo-ignition capsules are under study. Applied seed fields of 20-70T that compress to greater than 10000T (100MG) under implosion can reduce hotspot conditions required for ignition and propagating burn through range reduction and magnetic mirror trapping of fusion alpha particles, suppression of electron heat conduction and potential stabilization of hydrodynamic instabilities. The applied field may also reduce hohlraum laser-plasma instabilities and suppress the transport of hot electron preheat to the capsule. These combined B-field attributes may permit recovery of ignition, or at least significant alpha particle heating, in capsules that are otherwise submarginal through adverse hydrodynamic or hohlraum-drive conditions. Simulations indicate that optimum initial fields of 50T may produce multi-MJ-yields when applied to our present best experimental capsules. Proof-of-principle experiments for magnetized ignition capsules and hohlraum physics on NIF are now being designed.

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