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Simulated impact of self-generated magnetic fields in the hot-spot of NIF implosions M. A. PARTHA, S. W. HAAN, J. KONING, M. M. MARINAK, C. R. WEBER, D. S. CLARK, Lawrence LIvermore National Laboratory — Deviations from sphericity in an imploded hot-spot result in magnetic fields generated by the Biermann battery effect. The magnetic field can reduce thermal conductivity, affect α transport, change instability growth, and cause magnetic pressure. Previous estimates of these effects have indicated that they are not of great consequence, but have suggested that they could plausibly affect NIF observables such as yield and ion temperature by 5-25%. Using the MHD capability in the Hydra code, we evaluated the impact of these processes in a post-shot model for a typical NIF implosion. Various implosion asymmetries were implemented, with the goal of surveying plausible implosion configurations to find the geometry in which the MHD effects were the most significant. Magnetic fields are estimated to approach 10^4 Tesla, and to affect conductivity locally by more than 50%, but global impact on observables is small in most cases. *Work performed under the auspices of the U.S. D.O.E. by Lawrence Livermore National Laboratory under Contract No. DE-AC52-07NA27344.

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