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NIF Ignition Targets with Graded Copper-doped Beryllium Capsules[1] A.N. SIMAKOV, D.C. WILSON, K. YIRAK, J.L. KLINE, LANL, J.L. MILOVICH, J.D. SALMONSON, D.S. CLARK, D.A. CALLAHAN, M.M. MARINAK, LLNL — Current NIF plastic capsules are under-performing, and alternate ablators are being investigated. Beryllium presents an attractive option, since it has lower opacity and therefore higher ablation rate, pressure, and velocity [1,2]. We recently designed 300-TW, 345-TW and 420-TW NIF laser pulses for a current Be ignition capsule design in the standard 5.75 mm hohlraum; and investigated in integrated rad-hydro simulations sensitivity of main implosion characteristics to variations in the hohlraum fill gas density, laser beams pointing, and cross-beam energy transfer. An important conclusion is that the ablator shell in the current design is too thin, and thus Be ablation potential is not fully utilized. In addition, the capsule performance degradation due to ablator preheat is significant. Preliminary simulations indicate that the Be thickness can be increased 2-3 times, resulting, for the same radiation drive, in a significant increase in the fuel velocity and/or mass of unablated Be plus fuel. This can be used in a number of ways to mitigate mix, reduce preheat, and otherwise enhance the capsule performance. Herein, we present detailed results of this study.

[1] D. C. Wilson et al., Phys. Plasmas **5**, 1953 (1998).
[2] R. E. Olson et al., Phys. Plasmas **18**, 032706 (2011).

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