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Ignition hohlraum efficiency as a function of radiation temperature L.J. SUTER, S. HAAN, M. HERRMANN, Lawrence Livermore National Laboratory — The principal focus of hohlraum research for indirect drive ignition on the National Ignition Facility (NIF) are hohlraums that reach a peak radiation drive of ∼300eV. Here we examine the relative performance of ignition hohlraums designed to operate at different radiation temperatures. Current simulations indicate optimized coupling efficiencies, for similar hohlraums with similar capsules, of ∼16% at 300eV and ∼22% at 250eV. A large part of this rise in efficiency with reduced temperature is an ∼25% increase in the "apparent conversion efficiency". We quantitatively discuss the underlying reasons for the change in apparent conversion efficiency. The increase in efficiency, coupled with the lower radiation temperature, can reduce the single-quad laser intensity for the lower temperature hohlraums by about a factor of three. This can reduce the LPI linear gain and filamentation figure of merit. Finally, we combine these results with estimates of the required changes in capsule absorbed energy, as a function of temperature, to show the relative operating space of ignition targets at the two temperatures. This work was performed under the auspices of the U.S. Department of Energy by the University of California, Lawrence Livermore National Laboratory under contract No. W-7405-Eng-48.

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