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Reduced Mass Targets Heated by Ultra-Intense Lasers as a Means of Creating Kilovolt Plasmas at Solid Densities SCOTT C. WILKS, R.I. KLEIN[1], A. MACKINNON, S.J. MOON, P.K. PATEL, B.A. REMINGTON, D. RYUTOV, R. SHEPHERD, H. CHUNG, K. FOURNIER, G. GREGORI, S. GLENZER, S. HANSEN, R. SNAVELY, R. TOWN, Lawrence Livermore National Laboratory, J.M. HILL, Ohio State University — We introduce a novel target design that allows high temperature ($\sim$ 1 keV) solid density plasmas to be created using ultra-intense laser pulses. It is found that if targets composed of copper and tamped with aluminum are irradiated with $\sim$ 100 Joule, $\sim$ 10 picosecond lasers, a significant increase in temperature over standard foil targets can be achieved. Energy considerations will be used to theoretically predict achievable temperatures for a wide range of laser parameters for current and planned lasers, as well as a wide range of materials. Comparison of these predictions with recent experimental results obtained from the RAL Petawatt laser will also be presented. This work was performed under the auspice of the Department of Energy under Contract No. W-7405-Eng-48 and by the Laboratory Directed Research and Development (LDRD) Programs 04-ERD-028 and 04-ERD-023.

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