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Faster, 80ns, current scaling experiments yield higher radiated x-ray power and approach quadratic dependence[1] MICHAEL G. MAZARAKIS, MICHAEL E. CUNEO, WILLIAM A. STYGAR, HENRY C. HARJES, DANIEL B. SINARS, BRENT M. JONES, CHRISTOPHER DEENEY, EDUARDO M. WAISMAN, THOMAS J. NASH, KENNETH W. STRUVE, DILLON H. MCDANIEL, Sandia National Laboratories — We report the results of the latest series of current scaling experiments with the Z accelerator. The novelty of this work is the shorter implosion times of 80 ns as compared with the 95ns of the previously reported work. Our results show a radiated x-ray peak power and total radiated x-ray energy current scaling closer to quadratic than the results of Stygar *et al.* [Phys. Rev E **69**, 046403 (2004)]. If we include in the analysis all our thirteen shots, we find that the x-ray peak radiated power scales as the 1.57 power of the peak load current and the total x-ray radiated energy as the 1.9 power. However, we found that the power flow to the load during the shot 1608 was severely curtailed. If we eliminate that particular shot we find that the x-ray peak radiated power and total radiated energy scale respectively as 1.71 and 2.01 power. The present results are compared with the predictions of a heuristic and enhanced resistivity models.

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