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Simulations of Ar gas-puff implosions on Z with a Xe dopant[1]
VARUN TANGRI, Berkeley Research Associates, J. L. GIULIANI, A. L. VELIKOVICH, N. D. OUART, A. DASGUPTA, Plasma Physics Division, Naval Research Laboratory, J. W. THORNHILL, Berkeley Research Associates, J. P. APRUZESE, Consultant to the NRL through Engility Corp., A. J. HARVEY-THOMPSON, B. JONES, C. A. JENNINGS, Sandia National Laboratories — A recent experiment [1] on the Z machine at SNL indicated that the presence of a small fraction of Xe (0.8% by number in the center jet) in a Ar gas puff shot had a significant effect on the emitted K-shell radiation. In presence of the Xe dopant, the Ar K-shell yield dramatically reduced from 373 9 to 129 9 kJ. The peak K-shell power was also significantly lower and accompanied by two nearly equal peaks. A second shot without the Xe dopant consisted of a single peak. We present radiation-magnetohydrodynamic simulations of these shots [Z2603 (with Xe) and Z2605 (without Xe)] using the using the Mach2-TCRE code with a tabulated collisional radiative equilibrium model. Detailed numerical simulations exploring the impact of the Xe dopant on the implosion dynamics and the resultant K-shell radiation will be presented. Analysis of a time- and space resolved synthetic K-shell spectra would also be presented. [1] Harvey-Thompson et al., Submitted to Phys. Plasmas, (2016)

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