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Simulations of an Argon Z-pinch Implosion with time-dependent non-LTE kinetics N. OUART, A. DASGUPTA, J. GIULIANI, Naval Research Laboratory, B. JONES, D. AMPLEFORD, A. HARVEY-THOMPSON, C. JENNINGS, Sandia National Laboratories, V. TANGRI, R. CLARK, Berkeley Research Associates — Three argon gas-puff implosions were performed on the Z-machine at SNL. These three loads had the same density profile from an 8cm dia. nozzle, a 1mg/cm mass, and a 2.5cm length. The experiments produced similar radiative powers and yields (B. Jones et al. PoP 22,020706(2015)). Simulations with the 2D MHD code Mach2-TCRE reproduced the experimental K-shell powers, yields, and emission region. It was also shown that the ratio of the Lyα to Heα+IC lines from the simulation had good agreement to measurements after peak K-power; however, the simulation's line ratio was higher prior to the peak power. The authors attribute the difference to 3D effects or on the implicit assumption of steady-state population kinetics (J. Thornhill et al. IEEE TPS 43,2480(2015)). This presentation will illustrate the effect of time-dependent level populations on the radiation from simulations using the NRL DZAPP code. DZAPP is a coupled 1D MHD, detailed non-LTE atomic physics with radiation transport, incorporating a transmission line circuit. The line ratios and K-powers from the steady-state and time-dependent populations will be presented and compared with experiment. This work supported by DOE/NNSA. SNL is a multimission laboratory managed and operated by National Technology and Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International, Inc., for the US DOE/NNSA under contract DE-NA-0003525.

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