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Modeling of the LIFE minichamber Xe theta pinch experiment JAVE KANE, MARK RHODES, GWENDOLEN LOOSMORE, JEFFERY LATKOWSKI, JOSEPH KONING, MEHUL PATEL, GEORGE ZIMMERMAN, JAMES DEMUTH, Lawrence Livermore National Laboratory, GREGORY MOSES, University of Wisonsin Madison — The LIFE minichamber experiment is being designed to investigate cooling of the Xe buffer gas protecting the LIFE chamber wall. A magnetically driven theta pinch configuration will be used to inductively heat a few-cm long cylinder of Xe at ion density 2e16/cc to several eV. Thomson scattering will be used to determine the electron temperature and ionization state of the strongly radiating, cooling Xe. The experiment is being modeled using the magnetohydrodynamic code HYDRA with an external circuit mode and inductive feedback from the plasma to the external circuit. Designing the experiment is challenging due to the current paucity of opacity and conductivity data for Xe in the buffer gas regime of temperature and density. Results of the modeling will be presented.

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Jave Kane Lawrence Livermore National Laboratory

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