Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Exploring magnetized liner inertial fusion with a semi-analytic model* R.D. MCBRIDE, S.A. SLUTZ, D.B. SINARS, R.A. VESEY, M.R. GOMEZ, A.B. SEFKOW, S.B. HANSEN, K.R. COCHRANE, P.F. SCHMIT, P.F. KNAPP, M. GEISSEL, A.J. HARVEY-THOMPSON, C.A. JENNINGS, M.R. MARTIN, T.J. AWE, D.C. ROVANG, D.C. LAMPPA, K.J. PETERSON, G.A. ROCHAU, J.L. PORTER, W.A. STYGAR, M.E. CUNEO, Sandia National Laboratories — In this presentation, we explore magnetized liner inertial fusion (MagLIF) [S. A. Slutz et al., Phys. Plasmas 17, 056303 (2010)] using a semi-analytic model [R. D. McBride and S. A. Slutz, Phys. Plasmas 22, 052708 (2015)]. Specifically, we present simulation results from this model that: (a) illustrate the parameter space, energetics, and overall system efficiencies of MagLIF; (b) demonstrate the dependence of radiative loss rates on the radial fraction of the fuel that is preheated; (c) explore some of the recent experimental results of the MagLIF program at Sandia National Laboratories [M. R. Gomez et al., Phys. Rev. Lett. 113, 155003 (2014)]; (d) highlight the experimental challenges presently facing the MagLIF program (as MagLIF is first being tested using the infrastructure presently available at the Z pulsed-power facility); and (e) demonstrate how these challenges could change as various system upgrades are made to the Z facility over the next three to five years and beyond. *Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

Ryan McBride
Sandia National Laboratories

Date submitted: 23 Jul 2015 Electronic form version 1.4