Abstract Submitted
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A mathematical operator to describe neutron time-of-flight signals from magnetized liner inertial fusion experiments at the Z Pulsed Power Facility[1] COLIN WEAVER, GARY COOPER, CHRISTOPHER PERFETTI, JEDEDIAH STYRON, University of New Mexico, PATRICK KNAPP, CARLOS RUIZ, GORDON CHANDLER, MICHAEL MANGAN, Sandia National Laboratories, SARA PELKA, University of New Mexico, CLARK HIGHSTRETE, JOSE TORRES, GARY WHITLOW, Sandia National Laboratories — An analytic forward model is required to rapidly simulate the neutron time-of-flight (nToF) signals that result from magnetized liner inertial fusion (MagLIF) experiments for comparison to data. Since the objective functions that model these signals change for various scattering and attenuation geometries and different neutron sources, it is necessary to define a parameterized operator that outputs nToF signals for any MagLIF experiment. The operator was developed from first principles and is described heuristically, hence this technique can serve as a bench mark for other nToF diagnostic methods and can be applied to any inertial confinement fusion experiment. Important parameters describing the source plasma, such as ion temperature and liner areal density, can be extracted from experimental MagLIF data by using this operator in conjunction with a Bayesian inference formalism.

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