Abstract Submitted
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K-shell line ratios as a powerful constraint on plasma conditions in MagLIF experiments[1] PATRICK KNAPP, CHRISTOPHER JENNINGS, SHAILAJA HUMANE, STEPHANIE HANSEN, MICHAEL GLINSKY, ERIC HARDING, DAVID AMPLEFORD, Sandia National Laboratories — When interpreting trends in MagLIF experiments, we wish to know the relationship between stagnation conditions, performance, and morphology. Typically, stagnation conditions are inferred through a combination of imaging, nTOF, and neutron and x-ray yield measurements. Unfortunately, the observed morphology can strongly bias our inference of stagnation conditions which depends on an understanding of the fuel volume. The volume is constrained by 2D x-ray emission images, which tend to overestimate the neutron producing volume. We show here how the incorporation of K-shell line ratios of Fe ions that are mixed into the fuel into a Bayesian analysis of stagnation that self-consistently includes imaging as well as x-ray and neutron yields, can dramatically improve our understanding of stagnation conditions. The reason for this improvement is that K-shell line ratios are relatively insensitive to the fuel structure, providing an independent constraint on important quantities such as pressure. This improved accuracy leads to a higher fidelity understanding of the observed performance trends.

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