

Abstract Submitted  
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**Predictive capability for Z-Petawatt-driven high-energy  $K_\alpha$  x-ray yields used to image HEDP experiments on the Z Machine** A.B. SEFKOW, G.R. BENNETT, M. GEISSEL, M. SCHOLLMEIER, Sandia National Laboratories — The Z-Petawatt laser (ZPW) will provide a high-energy, ultra-short- duration  $K_\alpha$  x-ray source for imaging HEDP experiments on the Z Machine. Crucial to the best imaging performance is the attainment of the highest possible conversion efficiency  $\epsilon$  of laser energy into  $K_\alpha$  x-rays. We test novel target and imaging concepts aimed at dramatically increasing  $\epsilon$ , which, if realized, would be an outstanding benefit to the quality of our experiments on Z. The measured  $\epsilon$  in recent ZPW experiments was correctly predicted within the experimental uncertainty, and so provides confidence for our established capability to predict high-energy x-ray yield in other, novel target arrangements for increasing  $\epsilon$ . Quality and contrast improvements in high- energy x-ray imaging, whether from traditional or novel sources, are directly beneficial to HEDP experimental platforms such as Z and NIF.

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