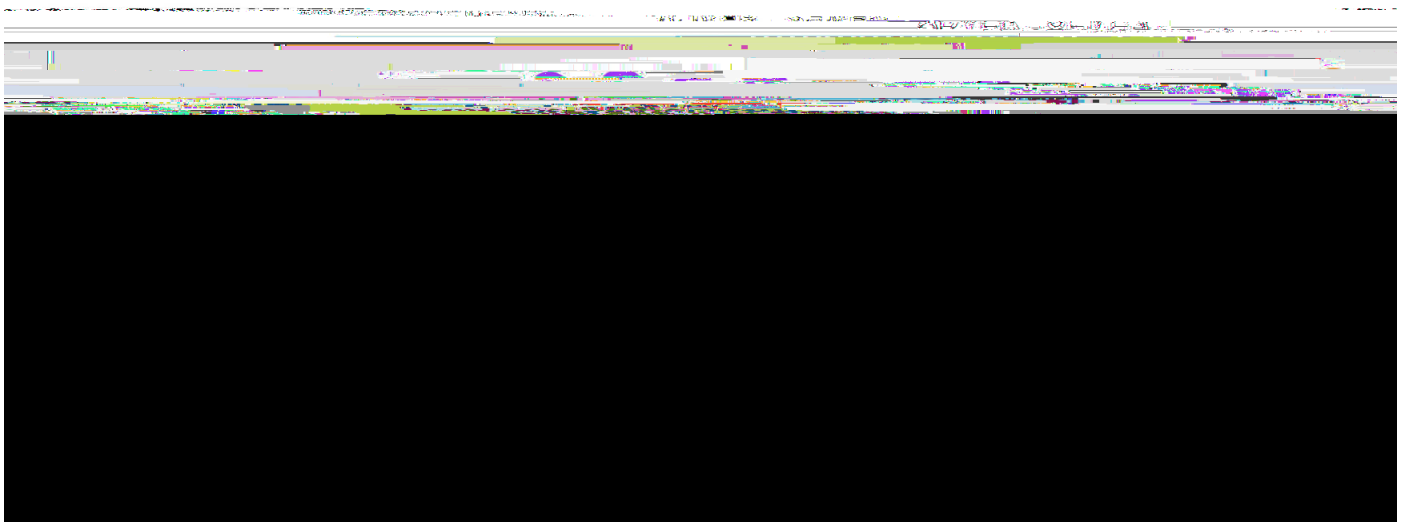

A novel zirconium Kα imager for high energy density physics research

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imager. We report on the contribution of photo-pumping to the Kα emission production in low-, mid-, and high-Z targets. We present, for the first time, two-dimensional spatially resolved monochromatic images of laser generated zirconium plasmas.

II. DEVELOPMENT OF THE ZIRCONIUM IMAGER

The two-dimensional Kα imager consists of a1214nd6hericially crystnal(to)387916(a)-9-(CCDo)387945(or)3879

FIG. 1. (Color online) Diffraction curve from SHADOW ray tracing. The bottom curve corresponds to Zr Kα_2 reflectivity from quartz $23\bar{5}4$ in second diffraction order. The top curve corresponds to Cu Kα_1 reflectivity from quartz $21\bar{3}1$ in second diffraction order.

FWHM of the diffraction curve is 1.4 mrad; similar to that of the Cu imager. These calculations suggest that the Zr imager is a useful diagnostic for high energy density physics (HEDP) with only four times reduction in the collected signal. However, as we will show in Sec. III B, the Zr imager performance is better than the Cu imageriplasma]TJ0-1.2006TD-0.0002Tc[(stemerfatur)-49107(e)-.3(s)24.8(fr-0.4(mcte)-49097(e)0.3(s

FIG. 3. (Color online) Collection efficiency of spherical Bragg crystals as a

FIG. 4. (Color online) Kα maps induced by photo-pumping for three 200 μm thick targets. Top: copper; middle: zirconium; bottom: gold.

where $_0$ is a normalization constant, θ_r is the local dispersion angle.[24]