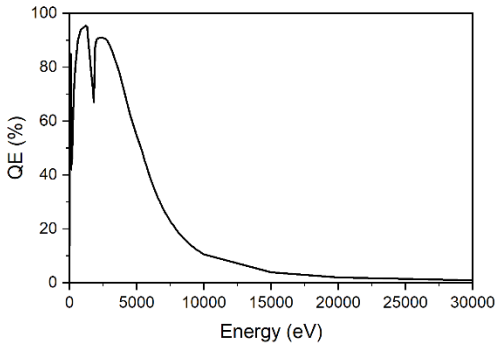
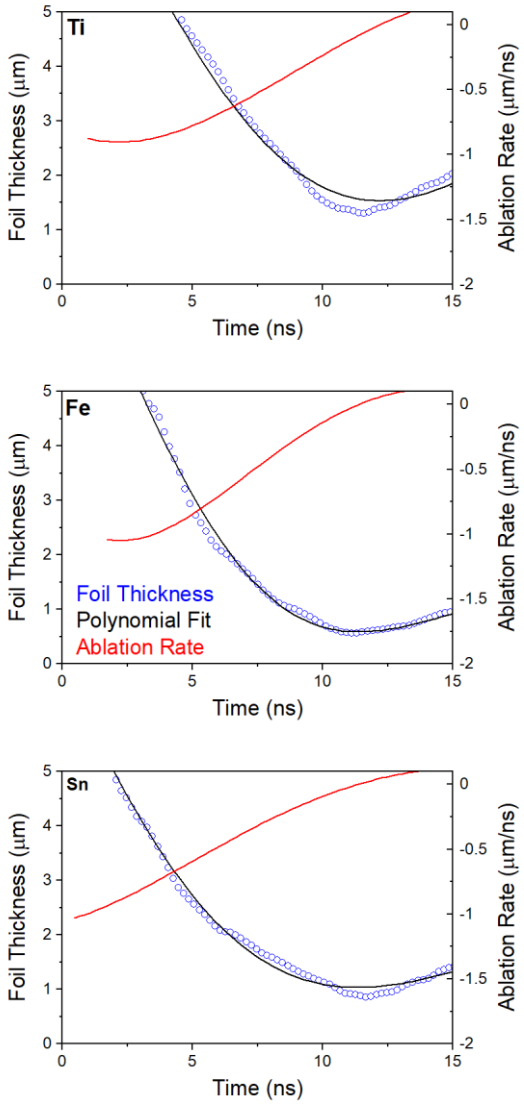
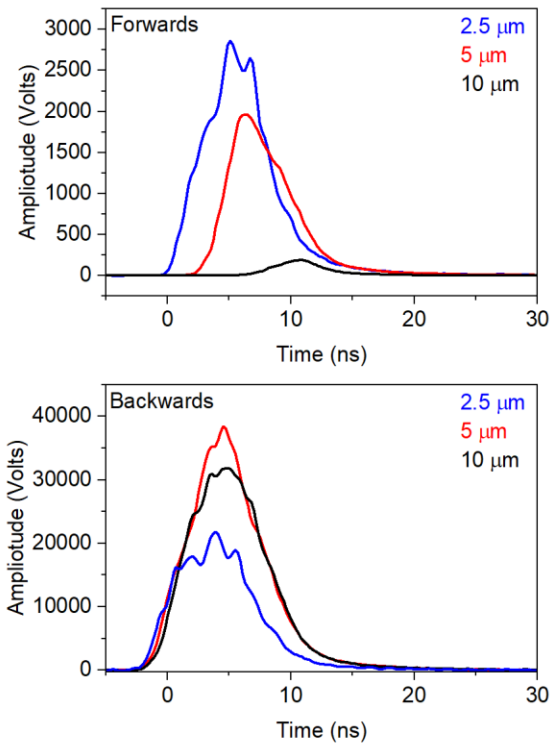
Supplementary Materials



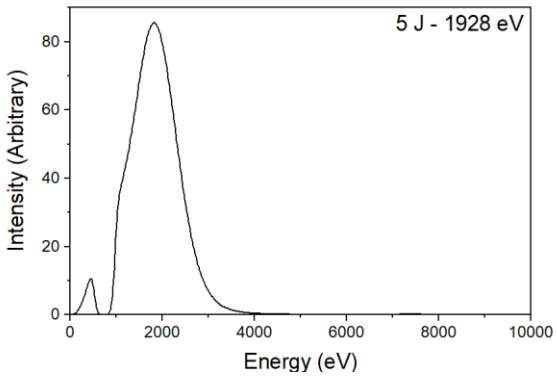
Supplemental Figure 1: Quantum efficiency of the Sophia-XO camera used to image the metal filter object. This data was provided by Teledyne Princeton Instruments.



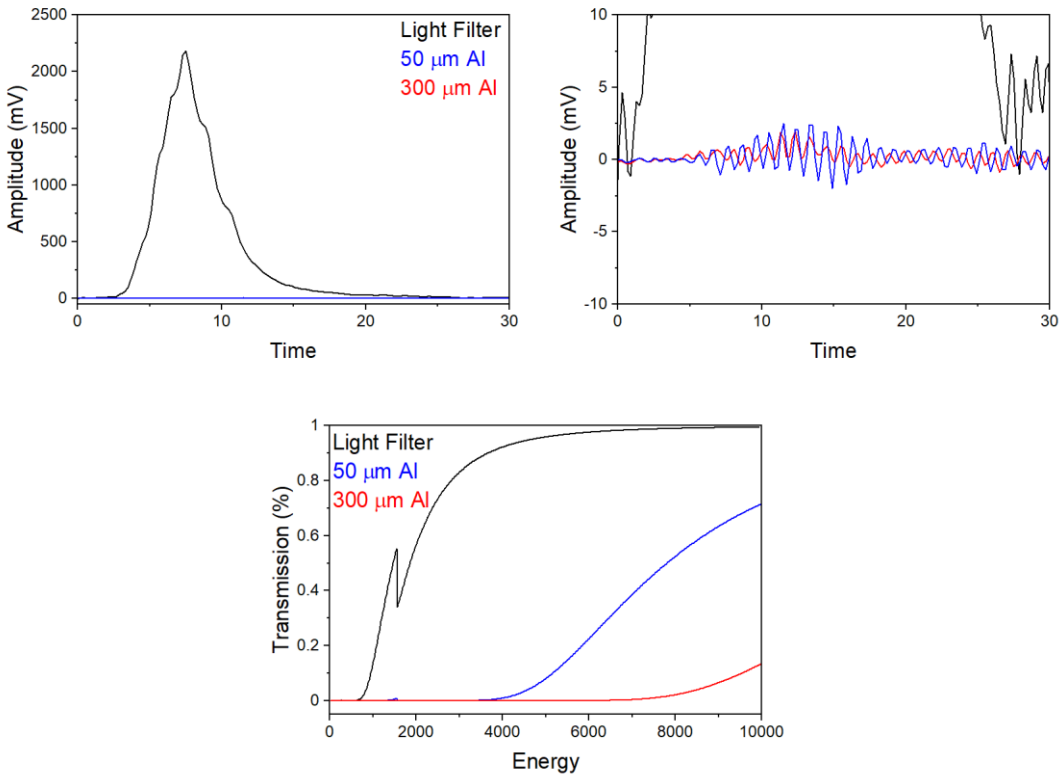
Supplemental Figure 2: Foil thicknesses and ablation rates for Ti, Fe and Sn.



Supplemental Figure 3: Raw data from the Cu foil thickness study. Notice that the signals from thinner foils in the forwards direction arrive earlier. Arrival times for signals in the backwards direction do not change with foil thickness.



Supplemental Figure 4: Estimated Cu spectrum with 4.0×10^{13} W/cm^2 without the inclusion of K-alpha and K-beta lines in the initial guess.



Supplemental Figure 5: Raw DRD signals for Cu 5 um targets showing only noise on DRDs with the higher energy filters. Transmission for those filters shown in the plot below.