This dataset includes experimental and reference data from the manuscript “Coded Aperture X-ray Imaging of High Power Laser-Plasma interactions on the Vulcan Laser System

A modified uniformly redundant array (MURA) x-ray coded aperture imager and x-ray pinhole camera were used to image the soft x-ray emission from the rear surface of targets irradiated with the Vulcan Petawatt laser. The image data was captured on Fujifilm SR Imageplate scanned at 50 micron resolution. The coded aperture had a magnification of 10x with a working distance of 75 mm from the interaction. Filtering of 26 micron Aluminium was used as an optical light block as well as to attenuate the x-ray signal. The pinhole camera had a magnification of 20x with a 25 micron Tantalum pinhole with a 25 micron Beryllium filter and a working distance of 25 mm.

Vulcan Petawatt Laser Shot Data:

Experiment # ID 171100029

|  |  |
| --- | --- |
| Experiment Shot ID # | 57 |
| Shot Date/Time | 28-7-17 / 9:38 |
| Target | Polysulphone 10 µm thick 100 x 100 µm |
| Energy from Laser (requested/received) | 300/299 J |
| Calculated on target energy | 77.8 J |
| Laser Pulselength | 686 fs |
| Wavelength | 1055.5 nm |
| Focal spot diameter (FWHM) | 6 um |
| Assumed encircled energy with in FWHM | 0.3 |
| X-ray Pinhole data file name | Pinhole\_and\_coded\_aperture\_raw\_shot\_57.tif |
| X-ray Coded Aperture data file name | Pinhole\_and\_coded\_aperture\_raw\_shot\_57.tif |

Optical Images of Coded Aperture itself:

|  |  |
| --- | --- |
| High magnification microscope image file name | High\_mag\_microscope \_image.tif |
| Low magnification microscope image file name | Low\_mag\_microscope\_image |