

EMP control and characterisation on the Vulcan laser

Figures listed below used data from this DOI: <http://dx.doi.org/10.15124/a5d78c76-0546-412c-8b02-9edcb75efbb7>

Figure 54 caption:

a) Normalized peak electric and magnetic field strength plotted as a function of laser energy. Measurements were taken using the D-dot and B-dot East probes. The red dashed line represents a best fit to the probe data, using a square root function of laser energy. b) Normalized peak magnetic field strength divided by the square root of on-target energy is plotted in black for a variety of laser pulse durations (B-dot East probe). Shown in red, is the number of emitted electrons (measured by an electron spectrometer) divided by the on-target laser energy. B-dot data is divided by the square root of the laser energy to account for the energy-dependence of EMP presented in panel a). Intensity ranged from 0.87 to $2.4 \times 10^{18} \text{ Wcm}^{-2}$.

Figure 55 caption:

Normalized peak electric field strength plotted as a function of laser energy for wire, flag and rectangular foil targets (D-dot probe East). Laser focal intensity ranges from 0.8 to $20 \times 10^{18} \text{ Wcm}^{-2}$. Notice how changing the wire diameter has led to a deviation from the relationship between EMP and on-target laser energy established in Fig. 54a.

Figure 56 caption:

a) Three different stalk designs: 1 – standard cylindrical geometry, 2 - sinusoidally modulated stalk with the same maximum cross-section as the standard cylinder, 3 - spiral stalk design with an identical diameter to 1. b) Normalized peak electric field strength plotted as a function of laser energy for aluminum and CH stalks with cylindrical, spiral and sinusoidal geometries. Data is taken from the D-dot East probe and presented as a fraction of the peak electric field for the aluminum stalk. Laser focal intensity varies between 0.8 and $20 \times 10^{18} \text{ W cm}^{-2}$.