



Surface dependence for laser induced target current by plastic materials (Poster P4)

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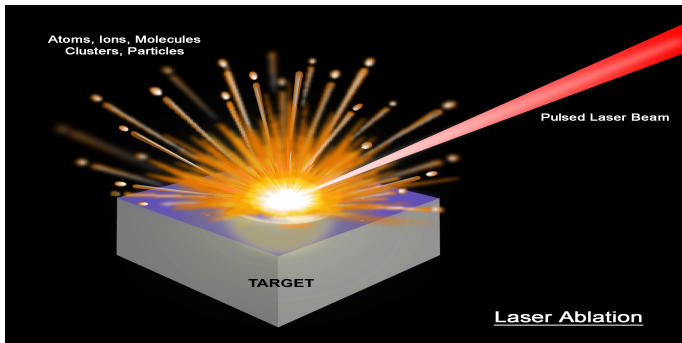
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Introduction

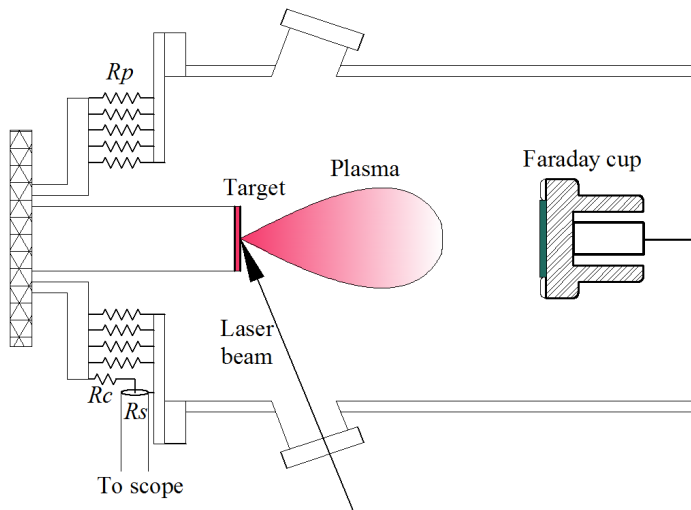
Laser ablation process



- ▶ Laser striking the target → vaporization of its first surface/subsurface layers
- ▶ Vapor cloud partially absorbs the remaining laser pulse, resulting in isothermal plasma formation and expansion
- ▶ Plasma expands anisotropically and adiabatically



Experimental setup



- ▶ Resistor ring to measure the target current
- ▶ Laser beam - target normal angle: 70°



▶ Laser properties

1. Excimer KrF
2. $\lambda = 248$ nm
3. $\tau = 23$ ns (FWHM)
4. irradiance $10^8 - 10^{10} \frac{W}{cm^2}$

▶ Faraday cup distance: 32.4 cm

▶ FC polarized to detect ions (-100 V)

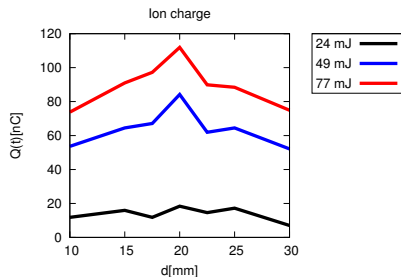
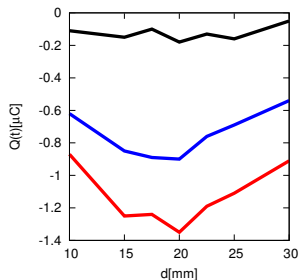
▶ Target holder: steel circle, 2.0 cm diameter

▶ Target voltage calculation:

$$U_T(t) = \frac{R_C + R_S}{R_S} U_S(t)$$



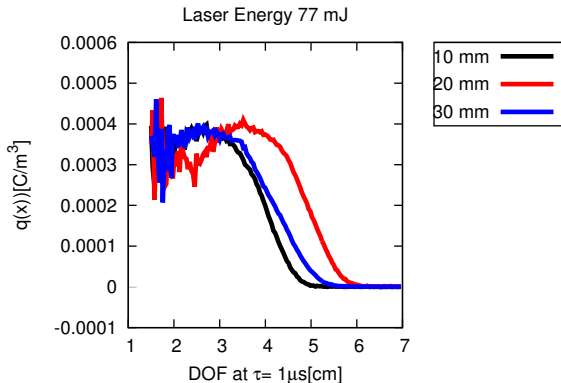
Surface dependence



- ▶ maximum when target surface = holder surface
- ▶ minimized target - holder interactions?



Ion front characterization



- ▶ ion spread wider in the red configuration
- ▶ different charge density characterization
- ▶ calculated from time resolved currents

$$q(x, \tau) = j(x)\tau L^3 x^{-4}$$

