

Calculation of the fluence during typical ablation process

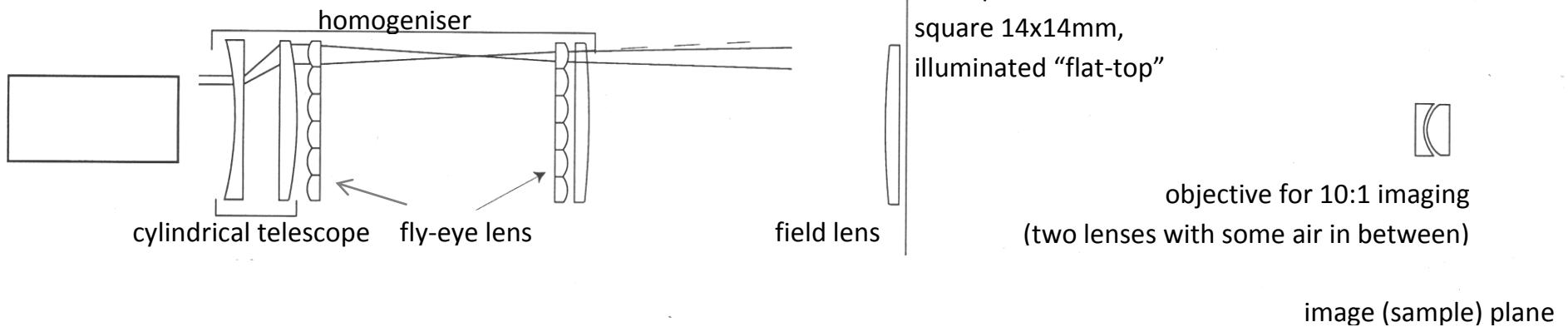
Aim: calculate fluence (J/cm^2) and irradiance (W/cm^2) on the sample.

Information:

Excimer laser emits 20ns pulses of light at 193nm wavelength with pulse energy 200mJ at repetition rate of 50Hz.

All optical element are made of UV grade quartz with anti-reflexion (AR) coatings on all surfaces. AR-coating makes that every interface reflects 1.8% of incident laser light (without the AR-coating it would be 4.86%). Absorption coefficient of quartz glass is $\alpha^{\text{quartz}}(193\text{nm})=3.9586 \text{ m}^{-1}$. Absorption coefficient of air is $\alpha^{\text{air}}(193\text{nm})=0.7440 \text{ m}^{-1}$.

Geometry information should be taken from the scheme.



Optical path in air is in total 2.3m.

Thicknesses of the lenses:

- cylindrical telescope: 6 mm altogether
- one "fly-eye" lens: 5mm
- last lens of homogeniser: 4mm
- field lens: 5mm
- objective: 10mm altogether