

- mirror R2/lense 1 and collimatorlense: 600mm - X
 - 615mm = optical way of the incoupling breadboard (450mm) + thickness breadboard (10mm) + distance between breadboard and vacuumchamber (30mm) + distance between vacuumchamber and cavity mirror R2 (130mm)
- collimatorlense and fiber: 2.75 mm

We used the programm *Strahl.exe* (@IQ) or *STRAHLFP.EXE* (@PTB) (same software, but different names).

Step 0: Choose parameter

- Wellenlänge: 1542 nm
- Brechungsindex: 1 (Air)
- Welcher Resonatortyp: linearer Resonator

Step 1: Beam waist calculation from resonator

- Nr. 1: Spiegel 1 with Brennweite 500 mm; Einfallwinkel: 0
- Nr. 2: Abstand 480 mm
- Nr. 3: Spiegel 2 with Brennweite 10000000000 (so viel es ging) mm; Einfallwinkel: 0

→ Waistradius: $w_0=w_2=495.2 \mu\text{m}$; Strahlradius on the mirrors: $w_1=686.7 \mu\text{m}$; $w_2=495.2 \mu\text{m}$

Step 2:

- Change Spiegel 2 to Linse 1
 - Brechungsindex: 1.5
 - Brennweite: -4000000000000000000 mm



The values of the Waistradius and Strahlradius must not change!!!

Step 3:

- Nr. 4: Abstand with Variable X
- Nr. 5: Linse 2 with Variable Y
- Nr. 6: Abstand 600 - X
- Nr. 7: Linse 3 with Brennweite 2.75 mm
- Nr. 8: Abstand 2.75 mm
- Zielwaist: $5.2 \mu\text{m}$

Step 4: Playing with the parameters X and Y for the best Überlapp

Case: Mirror R2/lense 1 and collimatorlense: 615mm - X

Lense focal length: Y [mm]	400	300	250	200	175
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Distance between mirror R2 and lense 2: X [mm]	258	314	335	375	400
Überlapp [%]	92.7	99.1	99.8	94.7	88.6

Step 5: Check what is happend for the wavelength 1560 nm

No effect!

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