

# 383 nm Laser system (T-MOT)

The 383 nm laser system consists of 767 nm lasers which are then frequency doubled to achieve 383 nm light.

## External Cavity Diode Laser (ECDL)

For 767 nm lasers, ECDL in Littrow configuration is used. Typically we used the laser diodes from Eagleyard Photonics: EYP-RWE-0790-02000-1500-SOT02-0000

Recently, Eagleyard has replaced these with new laser diodes: EYP-RWE-0760-02010-1500-SOT12-0000

## TA

- Output Power: 1.5 W
- Input Current: 2 A
- Injection Power: 32 mW
- Power behind 30dB Isolator: 1.05 W
- Originally this TA was used: EYP-TPA-0765-01500-3006-CMT03-0000. Is this still true?

## Fiber

- PMC-780-5,0-NA012-3-APC-200-P
- Incoupling: 67%
- Power behind fiber: 700 mW

# Frequenzy doubling

## LBO-Crystal

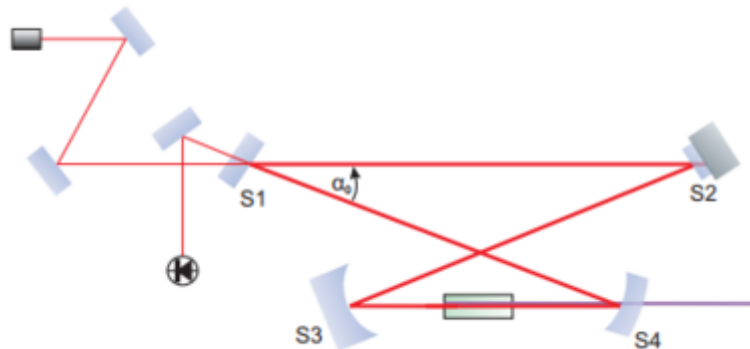
- Length: 15 mm
- AR coating

## Resonator

- Ring resonator (double Z configuration)
- Length: 280mm
- Curvature of mirrors: 50 mm (S3 and S4)
- Distance of mirrors: 64 mm
- Waist: 30μm (crystal), 130μm (long arm)
- Transmission: TS3 = 0.049%, T1 = 1.2 %
- Conversion efficiency ENL =  $6.1 \cdot 10^{-5} / W$

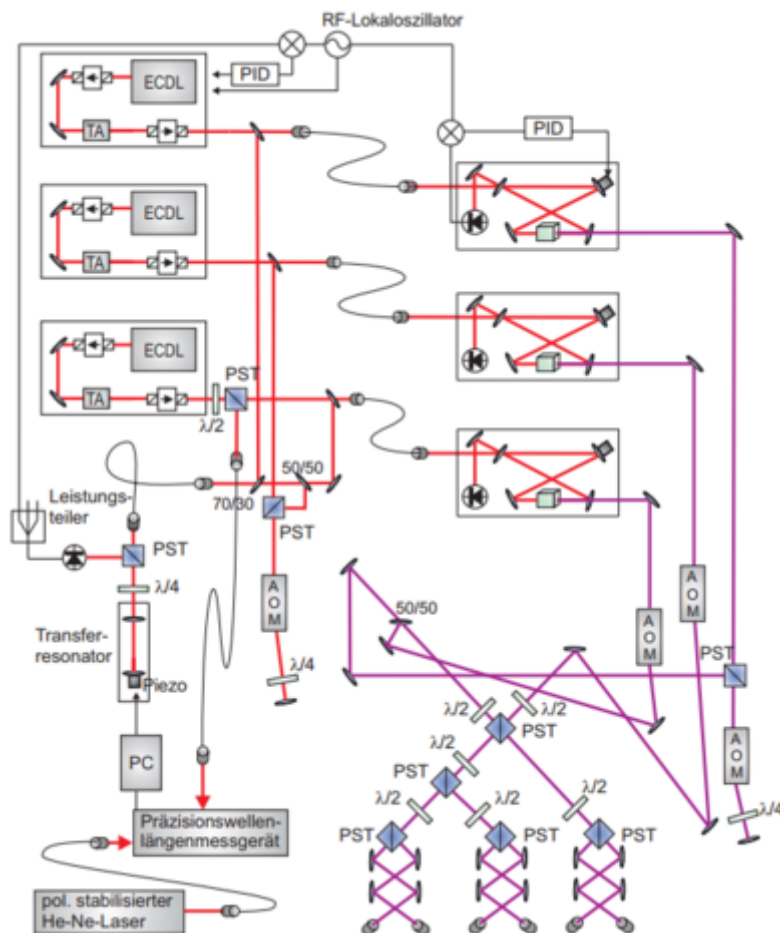
$$E_{NL} = \kappa L_c k_1 h_m(B, \xi)$$

- Linear losses:  $eL = 0.85(0.15) \%$
- Finesse:  $F = 270$



## Stabilisation

- PDH-Method
- Error signal at about 20 MHz



## Stabilisation: Laser 4 - Potassium

Dopplerfree Saturation Spectroscopy on D1 line of Potassium:



- 1st the two beams with similar intensity are generated by the beam sampler and are send trough the glas cell
- one part of the initial beam is going trough the sampler to a double pass aom and then in the other direction trough the glas cell, crossing only one beam. Important: the beam coming from the aom must have a much higher intensity!
- the first two beams, coming from the sampler trough the cell are than monitored by the PD. The signal is substracted

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