

# 285 nm-Laser (S-MOT)

The 285 nm Laser consists of a two-stage frequency doubled, raman-fiber-amplifier MOPA. The raman-fiber-amplifier is seeded by a diode laser.

- Laser-Diode current: 280 mA @which settings?
- Seed power (is displayed in the *FLPM RMU CCT 1.1.0.0* program): ~ 20 mW

## Turning on the Laser

- Enable main-switch. Now set the key to standby.
- Wait for the LED to change the color from orange to green to orange (~15 seconds after turning on). Turn the key now.
- Start the program *FLPM RMU CCT 1.1.0.0* and select the checkbox of *Laser Enable*.
- The *Power Setpoint* **must stay** at *0.500 W*
  - Optimize fiber coupling to *Iodine Spectroscopy*. Transfer-efficiency > 70%
- Change *Power Setpoint* for 285nm SHG operation
  - 2 - 2.500 W for 100-150 mW directly after 285 nm SHG.
  - Do not exceed much more than 3.5 W
- Flush the SHG with oxygen, by opening the bypass for roughly 10 seconds.
- Scan the SHG and optimize the incoupling and crystal position
- Lock the SHG, the voltmeter should display a value around 115 mV
- Activate the powerstabilization

## Turning off the Laser

- Unlock the laser in DigiLock
- Now just turn off the main-power on the laser
- Disable oxygen to 285nm SHG.

## Locking to Iodine-Spectroscopy

- Start *DigiLock-Module Server* and connect to *S-MOT-Laser*
  - Push *Scan on* and *AutoLock*
  - Change the *Offset Value* to 0 V
  - Change the frequency with the piezo on the toptica rack electronics to be close to the iodine resonance (check with wavemeter)
  - Change the *Setpoint* (under *AutoLock*) to be in the middle of the error signal. Check, if the crosshair snaps to the slope.

- Move the crosshair to the second slope, rightclick on press *PID: Lock to Slop*.

## Lasersystem - Typical power values

The 285nm SHG was build by Jan Friebe and is described in his diplomathesis.

### 570 nm-Laser

- Outputpower after cube to 285 nm-SHG: ~ 1.2 W @ 2.5 W 1140nm pump
- Operationpower: < @ 3 W
- Max outpupower: ??? W @ ??? W

### Iodine spectroscopy

#### 500 mW pump of the yellow laser

- Infront fiber: ~ 38 mW
- After fiber: ~ 29 mW @ 0.500 W (= 400 mV @ 0.500 W) [efficiency ~ 70 %]

#### Normal operation (2-3 W)

- After fiber: ~ 100 mW
- At iodine cell: 20-40 mW

### 285 nm-SHG

- Outputpower: ~ **100+ mW** @ 2.000 W
- Stabilized power (infront AOM): **80-90 mW**
- Power behind the AOM: **43 mW** @ 2.000 W (efficiency ~ 50 %)
- Power for the Zeaman-slower: **10 mW**
- Power behind the mystical mirrow: **30 mW**

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