

6.3.19

## FP20 - MOT

### Part 1: Calibration of the Doppler free spectroscopy.

Measured the transmission curve of a Pb-110 with the laser to determine transition peaks. Files saved as .txt.

5.3.19

### Part 2: Start of the MOT

We measure the Power of the ~~laser~~ lasers used for x, y, and z-axis of the MOT.

Before Split ~~xxx~~ 50 mW ~~to 5 mW~~

x+y and z Split z : 30 mW

x+y : 11 mW

x and y Split x : 5 mW

y : 2.5 mW

→ Detaken → z = 18 mW

x = 8 mW

y = 8 mW

### Part 3: Fluorescence signal and Loading curve

$V_{AOM} = 112.7 \text{ MHz}$

$\Delta V = -5 \text{ MHz}$  I = 7.5 A  $V_{RP} = 2930 \text{ MHz}$

I = 8.0 A

I = 8.5 A

I = 9.0 A

$V_{AOM} = 112.2 \text{ MHz}$

$\Delta V = -6 \text{ MHz}$  I = 7.5 A  $V_{RP} = 2929 \text{ MHz}$

I = 8.0 A

I = 8.5 A

I = 9.0 A

$V_{AOM} = 111.7 \text{ MHz}$

$\Delta V = -7 \text{ MHz}$  ...  $V_{RP} = 2928 \text{ MHz}$

$$117.2 \quad \Delta \nu = -8 \text{ MHz}$$

$$\nu_{pp} = 2927 \text{ MHz}$$

$$110.2 \quad \Delta \nu = -10 \text{ MHz}$$

$$\nu_{pp} = 29265$$

$$109.2 \quad \Delta \nu = -12 \text{ MHz}$$

$$\nu_{pp} = 2923$$

$$108.2 \quad \Delta \nu = -14 \text{ MHz}$$

$$\nu_{pp} = 2921$$

$$107.2 \quad \Delta \nu = -16 \text{ MHz}$$

$$\nu_{pp} = 2919$$

$$z = 14 \quad 8.5A$$

→ before mensur  
after

Part 4 Measuring Temperature by releasing and capturing Atoms

Shutclam time:  $\Delta t = 1, 2, 3, 4, 5 \text{ ms}$

AL0034.

$\Delta t = 7, 9, 11, 12, 13, 14, 15$

Camera out  
of focus?

17, 18, 19, 20, 21, 22, 23

Noticed at 8 → Deadground  
12 change?

24, 25, 27 . 28, 30  
10

14 Doppelt?

11 - 27  
eins doppelt

$\Delta t = 35, 40, 45, 55, 60$



$$\Delta v = -60 \text{ MHz} - 2 \times 55,2 \text{ MHz} + 2 \times 110,2 \text{ MHz}$$

$$= -10 \text{ MHz}$$

$$\Delta \nu_{RP} = 3035 \text{ MHz} - 120 \text{ MHz} + \underline{\Delta v}$$

$$= 2925 \text{ MHz}$$

$$\rightarrow \Delta v = -4 \text{ MHz}$$

$$\rightarrow \nu_1 = \overset{113}{407,2} \text{ MHz}$$

$$\boxed{\Delta v_2 = -5 \text{ MHz}}$$

30

$$\nu_2 = 112,2, \overset{1}{2} \text{ MHz}$$

$$\Delta v_3 = -6 \text{ MHz}$$

$$\nu_3 = 112,2 \text{ MHz}$$

$$\Delta v_4 = -8 \text{ MHz}$$

$$\nu_4 = 112,2, \overset{1}{2} \text{ MHz}$$

$$\Delta v_5 = -10 \text{ MHz}$$

$$\nu_5 = 110,2 \text{ MHz}$$

$$\Delta v_6 = -12 \text{ MHz}$$

$$\nu_6 = 109,2 \text{ MHz}$$

$$\begin{matrix} -14 \\ \nu_7 \end{matrix} \overset{1}{108,2} \text{ MHz}$$

$$\begin{matrix} -16 \\ \nu_8 \end{matrix} 107,2 \text{ MHz}$$

$\vec{B}$ -field

$$I = 7.5, 8, 8.5, 9 \text{ A}$$

$$\Delta v = -8$$

$$I = 9.0$$

could be missing

