

- AOM (+77.111 MHz) used for atom-lock + fiber stabilization(5m)
- AOM (+80.111 MHz) used for fiber stabilization(30m)
- Double-pass AOM (-2*102,XX MHZ) used for spectroscopy (frequency shift), feedback-loop!!!
- Channel 7 = 138 MHz (Synthesizer, referenced by 10 MHz GPS) - Double-pass AOM
- Atom frequency: $\nu_{\text{opt}}(\text{Mg}) = (3275292 \cdot \text{col}(\text{e}) \cdot 16 - 2 \cdot \text{col}(\text{d}) - \text{col}(\text{c}) + 80,111\text{e}6) \cdot 2 + 77,111\text{e}6$
- Laserfrequency: $f_{\text{laser}} = 3275292 \cdot \text{frep} \cdot 16 - 2 \cdot \text{fceo} - f_x$
- Resonator 1 frequency: $f_{\text{R1}} = 3275292 \cdot \text{frep} \cdot 16 - 2 \cdot \text{fceo} - f_x + (-2 \cdot f_{\text{AOM_R1}})$
- Double-pass AOM: $f_{\text{AOM_R1}} = 138 \text{ MHz} - f_{\text{Stell}}$

Virtuel-Beat

- $f_v = (f_y + f_{\text{ceo}}) - ((f_x + 2 \cdot f_{\text{ceo}}) / (3275292/1944000)) + (2 \cdot 10 \text{ MHz})$

Evaluation (PTB)

- $f_x = \text{col}(\text{c})$ (#1, negatives f_x)
- $f_{\text{ceo}} = \text{col}(\text{d})$ (#2) (negatives f_{ceo})
- $\text{frep} = \text{col}(\text{e})$ (#3, $\text{frep}/16$)

Test analysis

- $\nu_{\text{opt}}(\text{Mg}) - \nu_{\text{opt}}(\text{Mg2015})[\text{Hz}] = \nu_{\text{opt}}(\text{Mg}) - 655058646691000$

→ $\nu_{\text{opt}}(\text{Mg}) - \nu_{\text{opt}}(\text{Mg2015})[\text{Hz}] = (f_{\text{laser}} + 80,111\text{e}6) \cdot 2 + 77,111\text{e}6 - 655058646691000$

Frequency-Comb Braunschweig

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