

Virtual Beat Measurement

Theory

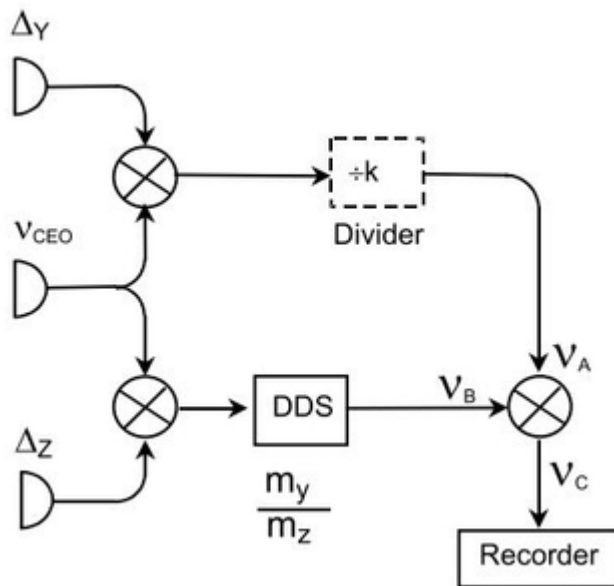


Equations:

- For Total Virtual Beat double f_{CEO}
- Compare to Postprocessing Virtual Beat Measurement!

Scheme from:

Kerr-lens mode-locked lasers as transfer oscillators for optical frequency measurements, H. R. Telle et al., arXiv:physics/0107037v1 [physics.optics] (2001)



Frequencies

- Jan's Laser = 194.401.549 MHz (fine with Protocolbook 194.401.556 MHz).
- 916nm clock laser: 327.5291 THz (accuracy maybe worse than 100 MHz)

Measured with wavemeter in PTB (accuracy: ± 30 MHz):

- 194.400.001 MHz Laser
- -47 MHz Regel-AOM
- +36 MHz Manypoint-extraktion-AOM

→ 194.399.990 MHz

Jan's transportable laser has a higher frequency:

- Mixer in Hannover run with +1515 MHz
- Beat is +44 MHz
- Jan's Laser = 194.401.549 MHz (fine with Protocolbook 194.401.556 MHz)

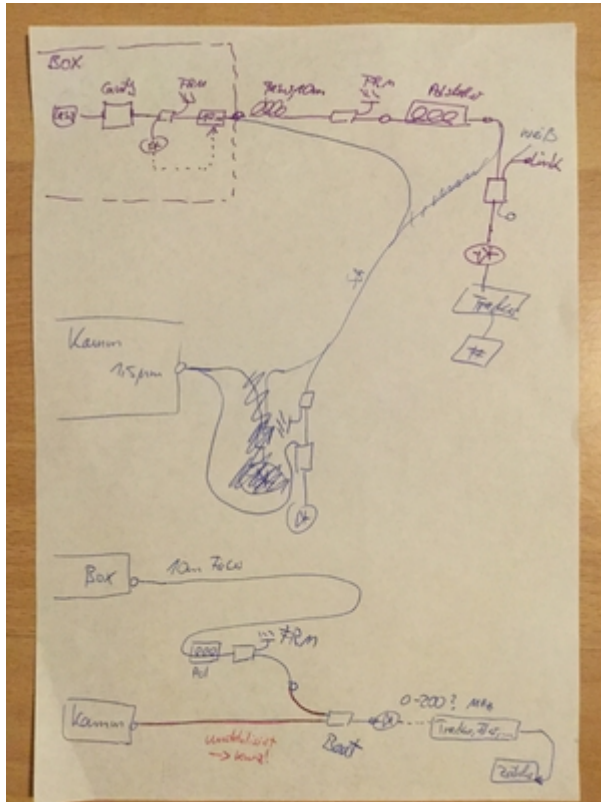
DDS-Programming

1. → ratio of $\sim 1,684807$
2. → 474231011086950,203392
3. [Hex]: 1AF4F82F51266
4. → Inverted Ratio: 0,5935397770762964267907798116259
5. $0,5935397770762964267907798116259 * 2^{48} = 167066594929398,49071775301797611$
6. 167066594929398 [Deg] entspricht 97F2390B6AF6 [Hex]

→ Type 97F2390B6AF6 into the divider!!!

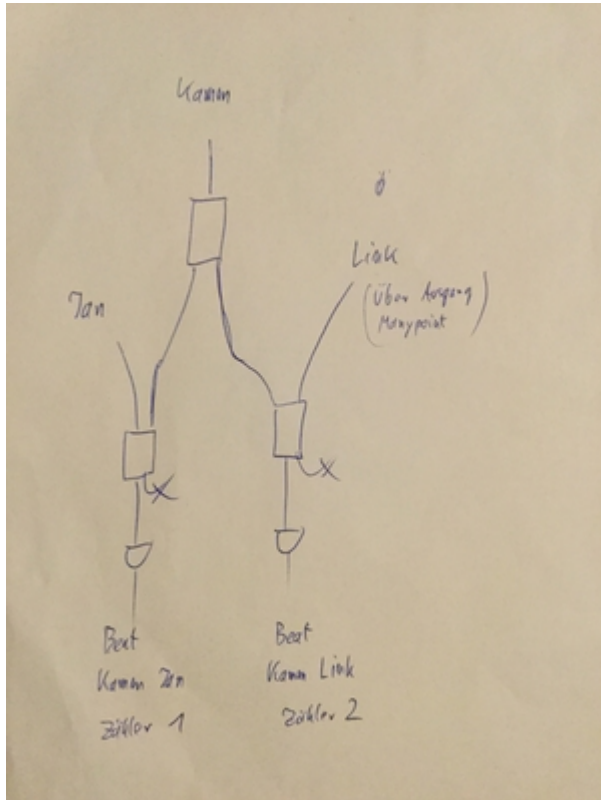
Setup for measurements

Jan's laser vs. Comb Hannover



- purple = current setup (06.10.2016)
- blue = setup for measurement
- red = unstabilized fiber → keep it short!

Jan's laser vs. Comb Hannover and Link vs. Comb Hannover



- Shift the ManyPointBox and Link to the optical table

From:

<https://iqwiki.iqo.uni-hannover.de/> - IQwiki

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https://iqwiki.iqo.uni-hannover.de/doku.php?id=groups:mg:virtual_beat&rev=1482226550

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