

DLR CO₂-Lidar Activities

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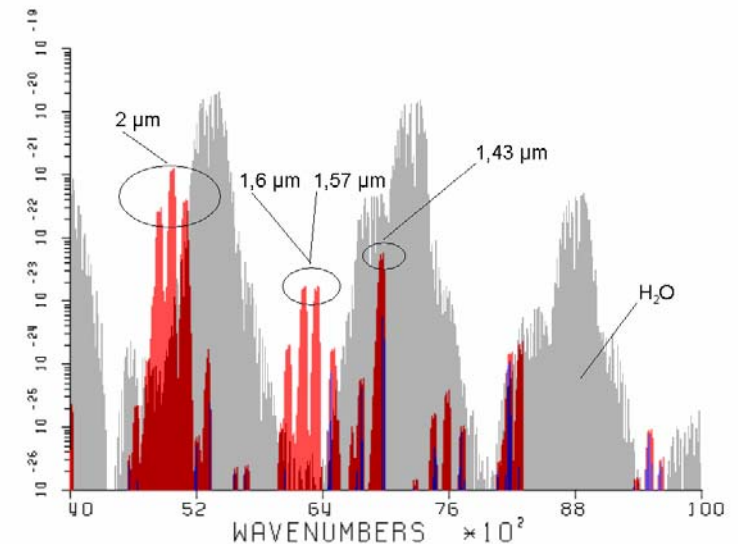
CO2 Integrated Path Differential Absorption

Table 1.3-3: Column measurements with hard target DIAL of CO₂ at different wavelengths; taken from [TN 120]

	<i>HT at 1.6 μm (ppmv)[#]</i>		<i>HT at 2.1 μm (ppmv)</i>	
	Target	Threshold	Target	Threshold
Precision	0.5	2.5	1	3.5
Temporal res.	week	month	week	month
Horizon. res.	200km	500km	200km	500km
Vertical res.	bnd.layer	bnd.layer	bnd.layer	bnd.layer

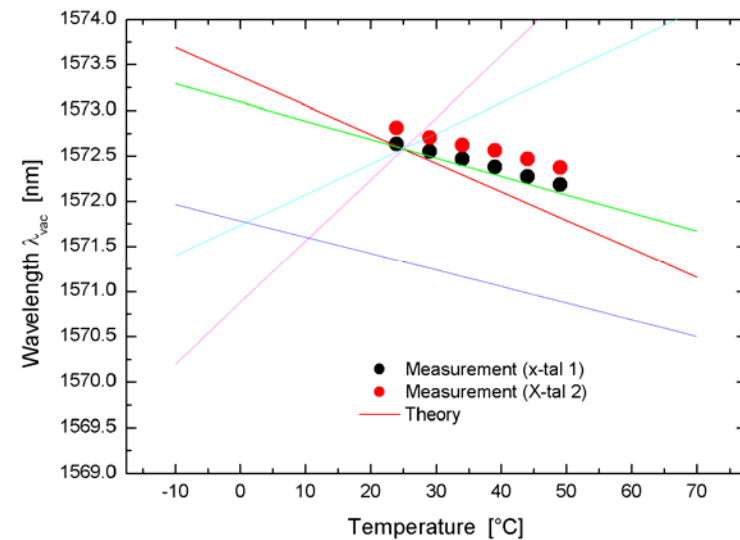
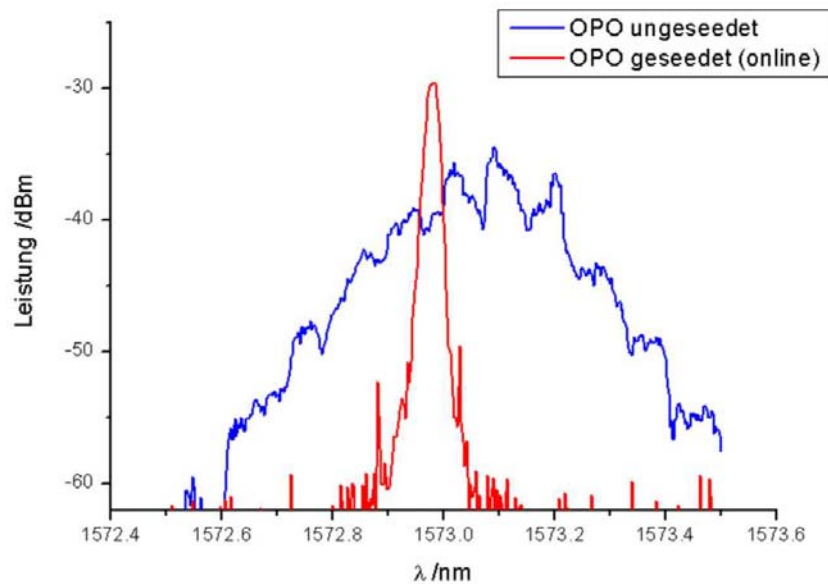
[#]: dry air mixing ratio

- Wavelength requirements :
1.57μm /2.01μm
- Precision!



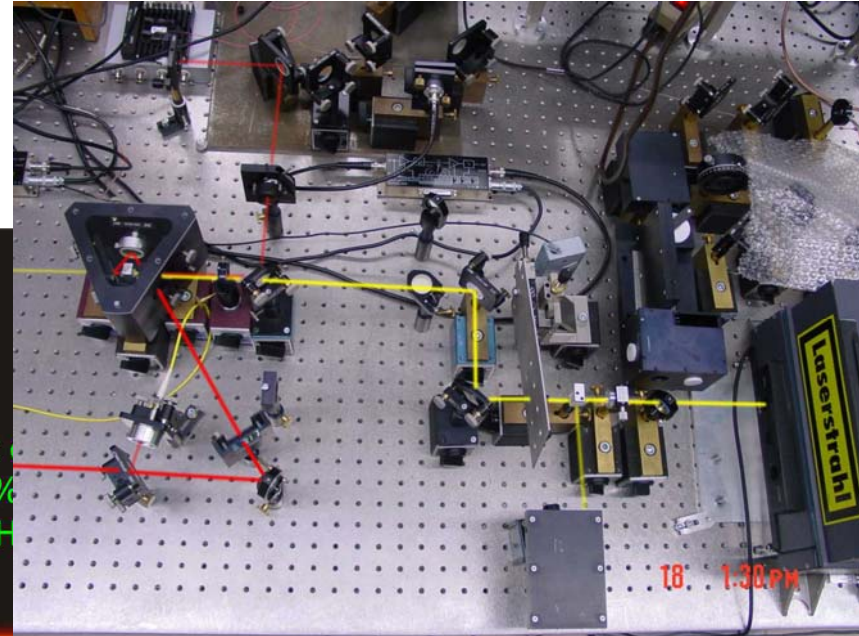
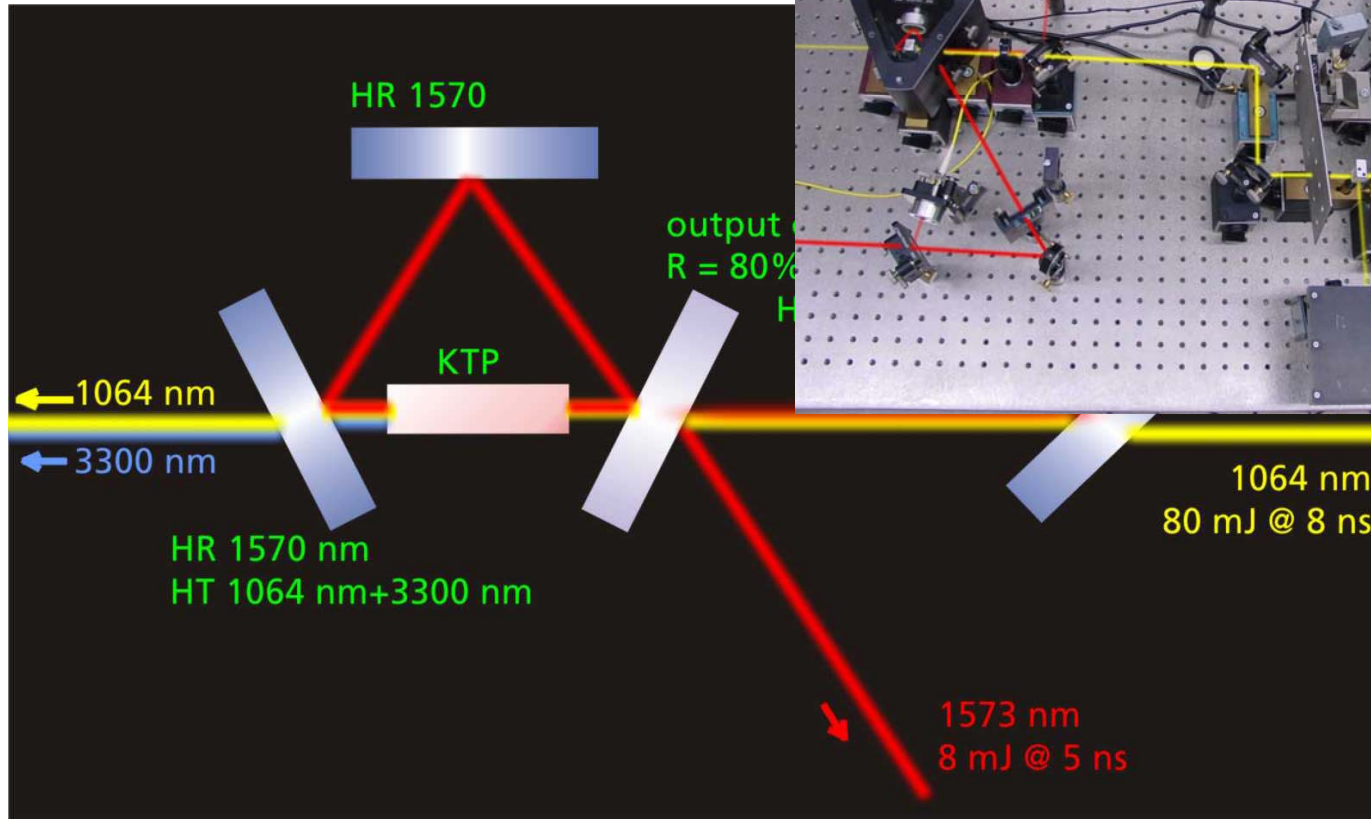
KTP OPO at 1.57 μm

Non-critically phase-matched (NCPM)

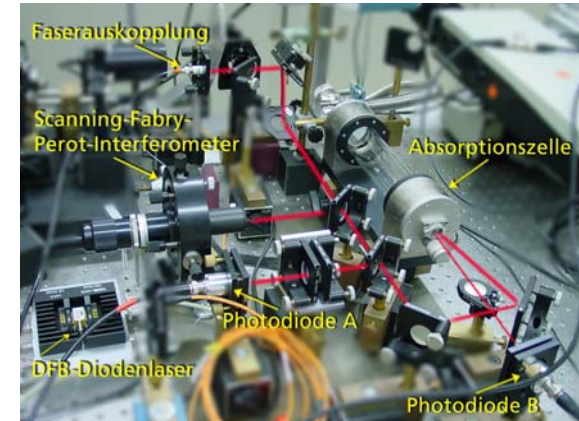
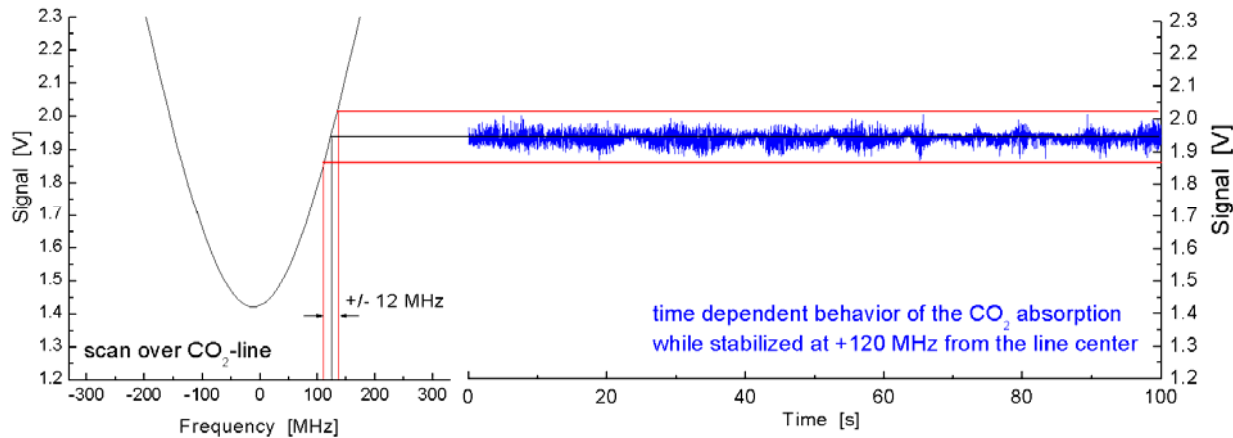


➤ Advantages of NCPM: No walk-off, best efficiency, optimum beam profile

1.57 μm OPO: Set-up

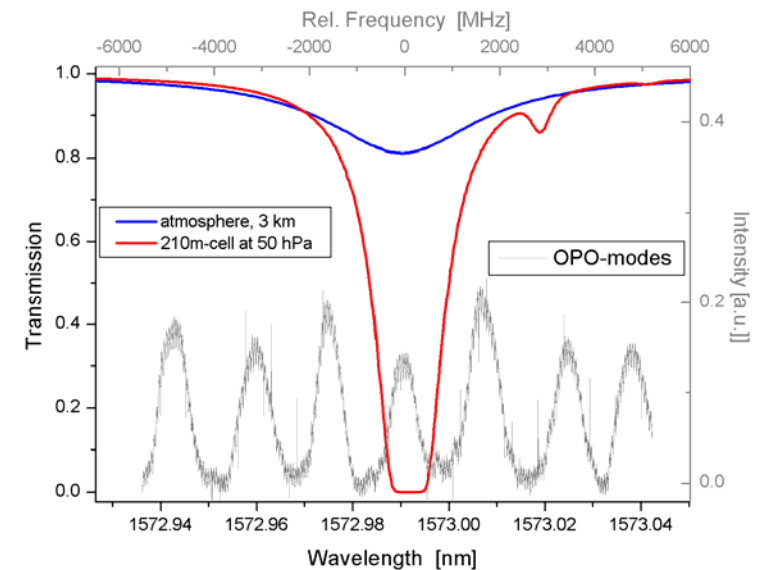


Spectral Properties: Frequency Stability and Spectral Purity

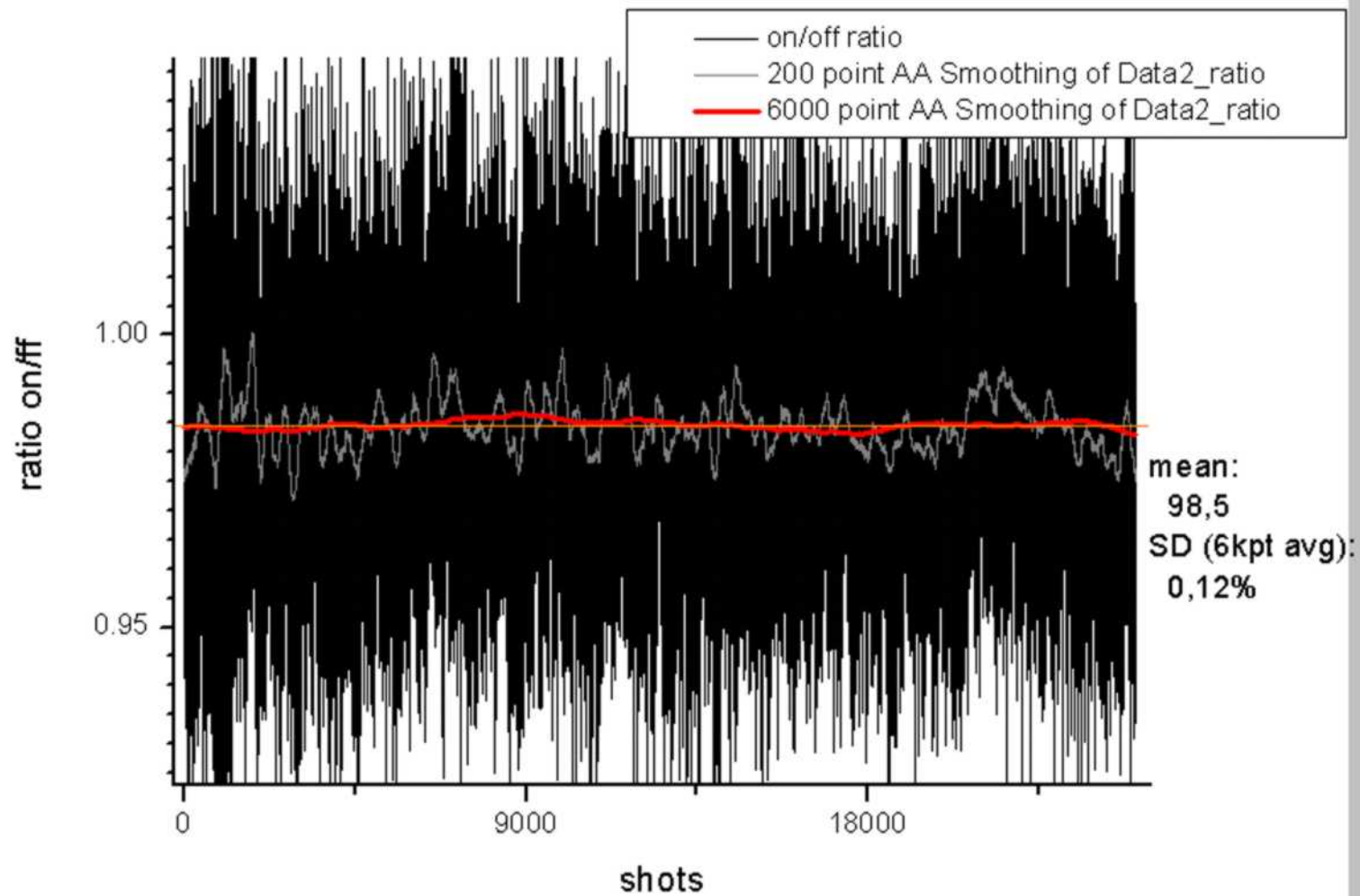


➤ Frequency Stability:
+/- 2,5 MHz rms
required: +/- 60 MHz

➤ Measured Spectral Purity:
at 50 hPa: > 99,9% (detection limit)



Short Range Zero-Measurement



First Long-Pass Measurements

