



Analysis of high resolution isotopic signatures of CO₂ at the high altitude site Jungfraujoch in the period 2008-2016

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A quantum cascade laser absorption spectrometer for measuring CO₂ and the isotopic ratios $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ has continuously been operated at the High Altitude Research Station Jungfraujoch (3580 m a.s.l.) since 2008. The measurement precision is about 0.02 ‰ for both isotope ratios for an averaging time of 10 min, while the accuracy was estimated to be 0.1 ‰ including the uncertainty of the calibration gases [1].

The isotope time series at Jungfraujoch has been extended by four years since the latest data evaluation [1] and currently spans almost eight years. We present first results of the time series analysis focusing on trends, year to year variations and the relation of the CO₂ concentrations to other trace gases measured at Jungfraujoch (e.g. CO). These investigations will be the basis for further analyses utilizing tools such as dispersion modelling.

References

[1] P. Sturm et al., 2013. Tracking isotopic signatures of CO₂ at the high altitude site Jungfraujoch with laser spectroscopy: analytical improvements and representative results. *Atmos. Meas. Tech.*, 6, 1659–1671. doi: 10.5194/amt-6-1659-2013.