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[113] Phase locking of two free running Quantum Cascade Laser frequency combs

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Dual comb spectroscopy using Quantum Cascade Laser (QCL) frequency combs, is a widely applied technique for identification of optical absorption features in the radio-frequency (RF) domain. Temperature fluctuations and electronic noise lead to often highly unstable heterodyne beating signals, hindering reproducible evaluation and analysis. We present a simple, yet reliable phase locking technique based on a dual feedback Optical Phase Locked Loop (OPLL), enabling locking bandwidths above 600 kHz for a heterodyne QCL frequency comb setup. A simplified theoretical model is applied to estimate the required parameters for the loop filters relying on a single measurement of the frequency modulation sensitivity of one frequency comb.

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