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【133】Dual-comb spectrometer by single Doppler shifted MIR QCL frequency comb

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We present a dual-comb spectrometer consisting of a free running frequency comb quantum cascade laser (QCL) and its Doppler shifted counterpart reflected from a fast scanning mirror. The stable multi-heterodyne signal is centered at $\sim$ 400 kHz and well defined by the linear scanning velocity of the reflector. This dual comb spectrometer features higher stability than the standard dual comb spectrometers, in which the mutual coherence of the two utilized combs limits the acquisition time to typically less than tens of μs. This brings indeed a great simplification compared to dual comb spectrometers, where the phase noise of the combs needs to be either actively suppressed or measured continuously and adaptively adjusted.

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