# Supplementary Information: An interband cascade laser based heterodyne detector with integrated optical amplifier and local oscillator

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**a**

## Detector Section Bias: -0.2 V
### *Heterodyne Beating*



**b**

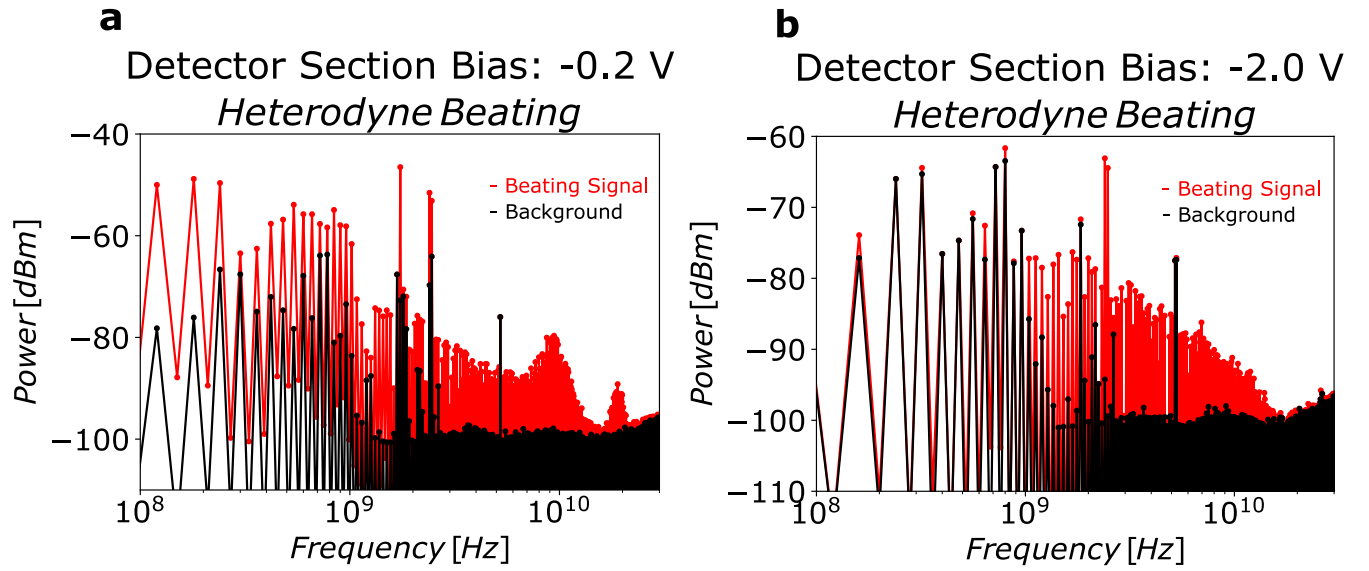## Detector Section Bias: -2.0 V
### *Heterodyne Beating*



FIG. 1. **Supplemental Figure 1:** (a) Heterodyne beating between the externally injected single-mode laser and the on-chip racetrack signal recorded up to a frequency of 30GHz on a spectrum analyzer. The black trace represents the background signal and the red trace the beating signal. The bias of the detector section was set to -0.2 V. The beating signal is well established above the noise floor up to a frequency of 20 GHz. (b) Heterodyne Beating recorded for a detector section bias of -2.0V. For increasing negaitve bias, the beating signal is only pronounced above background noise levels up to a frequency of 15 GHz. Both results were obtained by using the spectrum analyzer Max-Hold setting and tuning the temperature of the single-mode laser in order to sweep the resulting beating signal position.