10. Title: High-resolution heterodyne spectroscopy using a tunable quantum cascade laser around 3.5 THz

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Abstract: A frequency tunable terahertz heterodyne spectrometer, based on a third-order distributed feedback quantum cascade laser as a local oscillator, has been demonstrated by measuring molecular spectral lines of methanol (CH3OH) gas at 3.5 THz. By varying the bias voltage of the laser, we achieved a tuning range of similar to 1 GHz of the lasing frequency, within which the molecular spectral lines were recorded. The measured spectra show excellent agreement with modeled ones. By fitting we derived the lasing frequency for each bias voltage accurately. The ultimate performance of the receiver including the resolution of noise temperature and frequency is also addressed.