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Author

Ren Y. Hovenier JN. Higgins R. Gao JR. Klapwijk TM. Shi SC. Klein B. Kao T-Y. Hu Q. Reno JL.

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Ren Y.; Hovenier J. N.; Higgins R.; Gao J. R.; Klapwijk T. M.; Shi S. C.; Klein B.; Kao T.-Y; Hu Q.; Reno J. L.

Author/Editor Affiliation

Ren Y. Hovenier JN. Gao JR. Klapwijk TM. : Kavli Institute of NanoScience, Delft University of Technology, Lorentzweg 1, Delft 2628 CJ, Netherlands

Shi SC. : Purple Mountain Observatory (PMO), Chinese Academy of Sciences, 2 West Beijing Road, JiangSu, Nanjing 210008, China

Higgins R. : Department of Experimental Physics, National University of Ireland, Maynooth, Ireland

Klein B. : Max-Planck-Institut fur Radioastronomie (MPIfR), Auf dem Hugel 69, Bonn 53121, Germany

Kao T-Y. Hu Q. : Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Cambridge, MA 02139, USA

Reno JL. : Center for Integrated Nanotechnologies, Sandia National Laboratories, Albuquerque, NM 87185-0601, USA

Title

High-resolution heterodyne spectroscopy using a tunable quantum cascade laser around 3.5 THz Source

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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 GHz of the lasing frequency, within which the molecular spectral lines were ~ 1 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.(14 References).