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Title:Enhancement of spectral resolution and accuracy in asynchronous-optical- sampling terahertz time-domain spectroscopy for lowpressure gas-phase analysis
Authors:Yasui, Takeshi (1); Kawamoto, Kohji (1); Hsieh, Yi-Da (1); Sakaguchi, Yoshiyuki (1); Jewariya, Mukesh (2); Inaba, Hajime (3); Minoshima, Kaoru (3); Hindle, Francis (4); Araki, Tsutomu (1)
Author affiliation:(1) Graduate School of Engineering Science, Osaka University, 1-3 Machikaneyama, Toyonaka, Osaka 560-8531, Japan; (2) Institute of Technology and Science, University of Tokushima, 2-1 Minami-Josanjima, Tokushima, Tokushima 770-8506, Japan; (3) National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology, 1-1-1 Umezono, Tsukuba, Ibaraki 305-8563, Japan; (4) Laboratoire de Physico-Chimie de l'Atmosphère, Université du Littoral Côte d'Opale, 189A Av. Maurice, Schumann, Dunkerque 59140, France
Corresponding author:Yasui, T.(yasui@me.tokushima-u.ac.jp)
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Abstract:The spectral resolution and accuracy of asynchronous-opticalsampling terahertz time-domain spectroscopy (ASOPS-THz-TDS) were evaluated by examining low-pressure gas-phase samples. Use of dual 56-MHz, erbium (Er)-doped, mode-locked femtosecond fiber lasers enhanced the spectral resolution to as low as 50.5 MHz and the spectral accuracy to as low as 6.2 × 10-6. The results indicate that ASOPS-THz-TDS has the potential to achieve high spectral resolution, high spectral accuracy, and wide spectral coverage at the same time. ASOPS-THz-TDS will open a new door to gas-phase spectroscopy of multiple chemical species in the field of atmospheric gas analysis. © 2012 Optical Society of America.
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