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Authors:Kozuki, Kohei (1); Nagashima, Takeshi (1); Hangyo, Masanori (1)
Author affiliation:(1) Institute of Laser Engineering, Osaka University, Suita, Osaka 565-0871, Japan
Corresponding author:Nagashima, T.(nagasima@ile.osaka-u.ac.jp)
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Abstract:We present a frequency-domain electron spin resonance (ESR) measurement system using terahertz time-domain spectroscopy. A crossed polarizer technique is utilized to increase the sensitivity in detecting weak ESR signals of paramagnets caused by magnetic dipole transitions between magnetic sublevels. We demonstrate the measurements of ESR signal of paramagnetic copper(II) sulfate pentahydrate with uniaxial anisotropy of the g-factor under magnetic fields up to 10 T. The lineshape of the obtained ESR signals agrees well with the theoretical predictions for a powder sample with the uniaxial anisotropy.
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