

# TERAHERTZ SPECTROSCOPY OF METALS AND DIELECTRIC MATERIALS BY USING A COMPACT FREE ELECTRON LASER

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## Abstract

We have measured the optical characteristics of the metals and dielectric materials in terahertz range by using a compact free electron laser (FEL) in Korea Atomic Energy research Institute (KAERI). The FEL operates in the wavelength range of 100-11200 micrometers, which corresponds to 0.3-13 THz. THz radiation from the FEL shows much higher power of 1 kW compared to the power level, < 100 mW, of the table-top sources by conventional lasers. The FEL is a powerful tool to investigate the optical properties of materials in the THz region. It is discussed on the transmission dependence on the polarization-states of the FEL beams and the multiple beam interference observed from a thin specimen. We also report the FTIR (Fourier-transform infrared) spectroscopy of the materials in the THz region.

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