

Terahertz Spectroscopy of Solids

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Quantum materials actively investigated at the forefront of condensed matter physics demand access to low frequencies beyond the infrared. The terahertz region lying between the infrared and the microwave frequencies is emerging as a rich arena for exploring novel quasiparticle excitations in quantum materials. Recent developments in ultrafast pulsed lasers brought an unexpected opportunity to implement terahertz time-domain spectroscopy (THz-TDS). Here, the basic principle of standard THz-TDS is introduced along with powerful applications to fundamental research on quantum materials. Case studies including superconductors, topological insulators, and two-dimensional (2D) magnets will be presented.