Abstract Submitted
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THz pump-THz probe Cooper pair dynamics in MgB_2[1] JINGDI ZHANG, Department of Physics, Boston University, TENG TAN, Department of Physics, Temple University, MENGKUN LIU, Department of Physics, University of California, San Diego, WENQING DAI, Department of Physics, Pennsylvania State University, KUN GENG, Department of Physics, Boston University, QI LI, Department of Physics, Pennsylvania State University, XIAOXING XI, Department of Physics, Temple University, RICHARD AVERITT, Department of Physics, Boston University — THz pump-THz probe spectroscopy is used to study non-equilibrium superconducting carrier dynamics in MgB_2 thin films. An intense THz pump pulse resonantly breaks Cooper pairs, exciting quasiparticles across the lowest energy superconducting gap ($2\Delta_0$ $\approx$3.6meV corresponding to $\sim$ 0.8THz). The condensate and quasiparticle dynamics are temporally resolved by measuring the real and imaginary part of THz conductivity. Following THz excitation, the condensate density is strongly suppressed on a picosecond time scale coinciding with the emergence of a Drude peak. These results are compared with optical pump-THz probe experiments where, consistent with previous measurements, much slower Copper pair-breaking dynamics are observed.

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