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Time-resolved far-infrared spectroscopy of superconducting films in a magnetic field[1] HAIDONG ZHANG, D.H. REITZE, C.J. STANTON, D.B. TANNER, Department of Physics, University of Florida, R.P.S.M. LOBO, Laboratoire de Physique de Solide, ESPCI, Paris, France, G.L. CARR, National Synchrotron Light Source, Brookhaven National Laboratory — We report time-resolved, optical pump far-infrared probe measurements of thin superconducting films of NbTiN and NbN in applied magnetic fields. We used a picosecond near-infrared Ti:sapphire laser to pump the film and far-infrared synchrotron radiation from the National Synchrotron Light Source to probe the recombination dynamics of excess quasiparticles. Time resolution is up to a few hundred picoseconds. Despite the presence of the normal cores from vortices in the films, we find that the quasiparticle recombination time does not decrease with magnetic field. We also reported the photoinduced spectrum changes in far infrared transmission between two points on the quasiparticle decay curve in a magnetic field, which provided a measure of the excess quasiparticle density.

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