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Conventional and Time-Resolved Infrared Spectroscopy of La-1111 Thin Films[1] XIAOXIANG XI, Photon Sciences, Brookhaven National Laboratory, Y. M. DAI, C. C. HOMES, Cond. Matter Phys. & Mat'ls Sci Dept, Brookhaven National Laboratory, M. KIDSZUN, S. HAINDL, IFW Dresden, G. L. CARR, Photon Sciences, Brookhaven National Laboratory — We have performed both conventional as well as time-resolved far-infrared spectroscopy on $LaFeAsO_{1-x}F_x$ pnictide thin films. The conventional spectroscopy results can be fit using a simple gapped superconductor + normal conductor two-component model. Absorption by quasiparticles in a gap system with nodes is a plausible explanation for the normal component [Lobo *et al.* Phys. Rev. B 82, 100506(R) (2010)]. The time-resolved study is performed by laser-pump, far-IR probe spectroscopy using synchrotron radiation at NSLS beamline U4IR. A laser pulse breaks superconducting pairs and the synchrotron probe is used to sense the recombination process. In contrast to the picosecond response observed for cuprate superconductors, we observe a nanosecond response typical of a fully gapped superconductor where phonon-bottleneck effects slow the effective recombination rate. This result suggests the presence of a full isotropic gap, as might exist at lower energies due to electronic scattering [Carbotte *et al.* Phys. Rev. B 81, 104510 (2010)].

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