Time-resolved photoexcitation dynamics of the electrical conductivity of the magnetic organic superconductor *λ*-(BETS)2Fe0.45Ga0.55Cl4

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**Abstract**

The time-resolved photoexcitation dynamics of electrical conductivity of the magnetic organic superconductor ${\lambda}-(BETS)\_2Fe\_{0.45}Ga\_{0.55}Cl\_4$ has been studied with a nanosecond visible laser pulse at its three different phases, i. e., metallic phase, superconducting phase and insulating phase. A transient increase of the resistance is induced by photoirradiation at all the temperatures measured for all three phases, but the decay profile shows a significant temperature dependence. The relaxation rate in the metallic and insulating phase are different from each other, and the decay time is relatively faster and almost constant in the metallic phase. However, a prolongation of the relaxation time is observed at temperature just around the narrow superconducting phase. Nonbolometric (nonthermal) origin of the observed photoresponse of the electrical conductivity is confirmed in the superconducting phase.

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