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Ultrafast dynamics in $CeCoIn_5$ INNA VISHIK, FAHAD MAHMOOD , ZHANYBEK ALPICHSHEV, Massachusetts Institute of Technology, SHANTA SAHA, JOHNPIERRE PAGLIONE, University of Maryland, College Park, NUH GEDIK, Massachusetts Institute of Technology — We present ultrafast pump-probe and transient grating spectroscopy studies of the heavy Fermion superconductor $CeCoIn_5$. In pump-probe experiments, a 100-femtosecond 800nm-wavelength pulse creates transient electronic excitations whose decay is probed by studying transient changes in reflectivity as a function of time. We observe changes in pump-probe decay dynamics across the Kondo coherence temperature. In transient grating spectroscopy, two pump-pulses are interfered to produce a spatially periodic excitation, and the system's response to this periodic perturbation is studied through a diffracted probe beam. The temporal evolution of this signal indicates a non-trivial motion of the excitation grating in the heavy electron regime.

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