# Ultrafast photo-induced changes in the electronic structure of Fe-pnictide and cuprate superconductors

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Optically excited states in solid materials exhibit ultrafast relaxation due to coupling of the excited states to further electronic and vibrational excitations. Therefore, analysis of these excited states directly in the time domain probe fundamental interactions like e-e and e-ph interactions. The involved time cales are determined by the respective coupling strength and are typically in the femtosecond regime [1,2]. We apply time- and angle-resolved photoemission to investigate the transient population in excited states and changes in the electronic structure. A comparison of different methods to analyze the excess energy relaxation in 122 Fe-pnictides show consistently a rather weak e-ph coupling [3] with a strongly momentum-dependent relaxation below the Néel temperature due to a spin-dependent decay channel [4]. In the Bi-2212 cuprates the effective mass and Fermi momentum is changed upon optical pumping on essentially different ultrafast timescales. We show that the interaction producing the kink can be perturbed on timescales of a few tens of femtoseconds. The change in the Fermi momentum indicates photo-doping and suggests novel schemes for electro-optical applications.

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