# Optical spectroscopy study on Fe- and Ni-based pnictides

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The discovery of superconductivity above 50 K in iron-pnictides has attracted tremendous attention. The close relation between the superconductivity and magnetic instability suggests that the magnetic fluctuation plays an important role. In this talk, I shall present optical spectroscopy investigations on single crystal samples of several different Fe- and Ni-based pnictide systems. For all FeAs-based parent compounds we observed common spectral features: partial energy-gaps formation along with a removal of a large part of free-carrier spectral weight and a steep reduction of the carrier scattering rate in the magnetic ordered state. However, the 11-type FeTe behaves very differently. No energy gap opens in the magnetic state. We argue that both the itinerancy and local moment interactions of Fe 3*d* electrons are present, but contribute differently to the magnetic instabilities in different systems. For the doped superconducting samples, we observed the pairing gaps with an *s*-wave line shape in the superconducting state. The Ferrell-Glover-Tinkham sum rule is satisfied at a low energy scale. Finally we show that the first order phase transition at 130 K in $BaNi_2As_2$ is essentially different from the SDW type transition as observed in $BaFe_2As_2$.