

SFB 608

Einladung zum Kolloquium

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Sprecher: C. Hess
IFW Dresden

Thema: The intrinsic electronic phase diagram
of iron-pnictide superconductors

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We present a detailed study of the intrinsic electronic phase diagram of the oxypnictide superconductors in the normal state based on the analysis of the electrical resistivity ρ of both $\text{LaO}_{1-x}\text{F}_x\text{FeAs}$ and $\text{SmO}_{1-x}\text{F}_x\text{FeAs}$ for a wide range of doping. Our data give clear-cut evidence for unusual normal state properties in these new materials. As a function of doping ρ of $\text{LaO}_{1-x}\text{F}_x\text{FeAs}$ shows a clear transition from pseudogap to Fermi liquid-like behavior, mimicking the phase diagram of the cuprates. Moreover, our data reveal a correlation between the strength of the pseudogap signatures and the stability of the superconducting phase. The pseudogap signatures, which are clearly connected with the structural and magnetic transitions of the parent material, become stronger in $\text{SmO}_{1-x}\text{F}_x\text{FeAs}$ where superconductivity is enhanced and vanish when superconductivity is reduced in the doping region with Fermi liquid-like behavior [1]. We further present evidence for the connection between the pseudogap signatures in electrical transport and the slowing-down of spin fluctuation.

[1] C. Hess et al., Preprint at <http://arxiv.org/abs/0811.1601>

Gez. M. Braden