Nematic-driven anisotropic electronic properties of underdoped detwinned Ba $(\text{Co}_x\text{Fe}_{1-x})_2\text{As}_2$ revealed by optical spectroscopy

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Nematic Phase
Broken Rotational Symmetry in the Pseudogap Phase of Cuprates

Daou et al., Nature 463, 519 (2010)
Experimental Evidences of Nematicity in Iron-Pnictides

Chu et al., Science 329, 824 (2010)
Twin Formation in Underdoped Fe-Arsenide Superconductors

Fisher et al., Rep. Prog. Phys. 74, 124506 (2011)
Ferroelastic Tetragonal-to-Orthorhombic Transition

Pressure and Temperature Dependence of the Optical Anisotropy in Ba(Fe$_{1-x}$Co$_x$)$_2$As$_2$ (x=0)

Comparison of the Optical Anisotropy between $x=0$ and $x=0.045$
Saturation and Remanent Phase in the Optical Anisotropy for $x=0$, 2.5% and 4.5%
Drude Weight and Scattering Rate in Detwinned 122-Compound

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Optical versus DC Resistivity Anisotropy in Detwinned 122-Compounds

Dichotomy between DC Transport and Optics
Optical versus DC Transport Anisotropy

\[ \frac{\Delta \rho(T)}{\rho(T)} = \frac{2(\rho_b - \rho_a)}{(\rho_a + \rho_b)} \]

(a) Graph showing the relationship between temperature (T) and the ratio \(\Delta \rho/\rho\) for different pressures:
- 0 bar
- 0.4 bar
- 0.8 bar

Optical Nematic Susceptibility

Conclusions
Acknowledgements

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Thank You for Your Attention