Competition between Electron-Phonon coupling and Spin Fluctuations in superconducting hole-doped CuBiSO

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9.7 cm

CuBiSO is a band insulator, that becomes metallic upon hole doping. Both the crystal and electronic structure are similar to that of Fe-pnictides superconductors, albeit with very different electronic filling. Superconductivity was recently reported in doped Cu_{1-x}BiSO and attributed to spin fluctuations as the pairing mechanism. Based on first principles calculations of the electron-phonon coupling, we argue that the latter is very strong in this material, and probably drives superconductivity. The critical temperature is however strongly depressed by the proximity to magnetism. Thus, Cu_{1-x}BiSO is a quite unique compound where both a conventional phonon-driven and an unconventional triplet superconductivity are possible, and compete with each other. We argue that, in this material, it should be possible to switch from conventional to unconventional superconductivity by varying such parameters as doping or pressure.

13.4 cm

Subject category :

1. Strongly Correlated Electrons and High Temperature Superconductivity

Presentation mode :
poster

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