



Contribution ID: 137

Type: Talk

【146】 Using uniaxial stress to probe the relationship between competing superconducting states in a cuprate with spin-stripe order

Thursday 30 June 2022 18:15 (15 minutes)

I will present muon spin rotation and magnetic susceptibility experiments on in-plane stress effects on the static spin-stripe order and superconductivity in the cuprate system $\text{La}_{2-x}\text{Ba}_x\text{CuO}_4$ with $x = 0.115$ [1]. An extremely low uniaxial stress of ~ 0.1 GPa induces a substantial decrease in the magnetic volume fraction and a dramatic rise in the onset of 3D superconductivity, from ~ 10 to 32 K; however, the onset of at-least-2D superconductivity is much less sensitive to stress. These results show not only that large-volume-fraction spin-stripe order is anti-correlated with 3D superconducting coherence, but also that these states are energetically very finely balanced, imposing an important constraint on theoretical models.

[1] Guguchia et al., Phys. Rev. Lett. 125, 097005 (2020).

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Session Classification: Condensed Matter Physics

Track Classification: Condensed Matter Physics (KOND)