Poster-1-26

Strain in multi-orbital superconductors: the case of SrRuO4

Aline Ramires

Paul Scherrer Institute, Villigen 5232, Switzerland

Uniaxial strain experiments have become a powerful tool to unveil the character of unconventional phases of electronic matter. Here we propose a combination of the superconducting fitness analysis and density functional theory (DFT) calculations in order to dissect the effects of strain in complex multi-orbital quantum materials from a microscopic perspective. We apply this framework to the superconducting state of Sr2RuO4, and argue that the recently proposed orbitally anti-symmetric spin-triplet (OAST) order parameter candidate [1] has unique signatures under strain which are in agreement with recent observations. In particular, we can account for the asymmetric splitting of the critical temperatures for compressive strain along the direction, and the reduction of the critical temperatures for compressive strain along the and directions with a single free parameter [2].

[1] Han Gyeol Suh, Henri Menke, P. M. R. Brydon, Carsten Tim, Aline Ramires and Daniel F. Agterberg, Stabilizing Even-Parity Chiral Superconductivity in Sr2RuO4, Phys. Rev. Research 2, 032023(R) (2020).
[2] Sophie Beck, Alexander Hampel, Manuel Zingl, Carsten Timm, and Aline Ramires, The effects of strain in multi-orbital superconductors: the case of Sr2RuO4, arXiv.2111.13506 (2021).