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Evidence of P-wave Pairing in K2Cr3As3 Superconductors from Phase-sensitive Measurement

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P-wave superconductors hold immense promise for both fundamental physics and practical applications due to their unusual pairing symmetry and potential topological superconductivity. However, the exploration of the p-wave superconductors has proved to be a complex endeavor. Not only are they rare in nature but also the identification of p-wave superconductors has been an arduous task in history. For example, phase-sensitive measurement, an experimental technique which can provide conclusive evidence for unconventional pairing, has not been implemented successfully to identify p-wave superconductors. Here, we study a recently discovered family of superconductors, A2Cr3As3 (A = K, Rb, Cs), which were proposed theoretically to be p-wave superconductors. We fabricate superconducting quantum interference devices (SQUIDs) on exfoliated K2Cr3As3, and perform the phase-sensitive measurement. It reveals the admixture of 0- and π-phase in these SQUIDs, and we conclude that the existence of the π-phase is in favor of the p-wave pairing symmetry in K2Cr3As3.
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Field of Condensed Matter

Superconductivity

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