



量子物理学・ナノサイエンス第 194 回セミナー

Superconductivity in time-reversal-symmetry-broken two-dimensional system: application to FeSe

- 講師** : Dr. Mark Fischer
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- 日程** : 9月19日(火) 13:30-14:30
- 場所** : 本館2階 H284B 物理学系輪講室

概要

Monolayer FeSe on SrTiO₃, which exhibits high-temperature superconductivity, has recently been proposed to additionally possess (Néel) antiferromagnetic order. This magnetic order, however, breaks both inversion and time-reversal symmetry, the two symmetries guaranteeing a weak-coupling superconducting transition in three dimensions. Motivated by this finding, I will reexamine the minimal symmetries protecting superconductivity in two dimensions and the resulting order parameters. I will show that having a combination of either symmetry with a mirror operation on the basal plane is sufficient in two dimensions and discuss a minimal model with only one of the symmetries present. Finally, I will apply these considerations to the case of FeSe. Interestingly, despite having both combined symmetries, only one superconducting state is fully stable in antiferromagnetic FeSe, namely a chiral spin-triplet order, while any phonon-mediated s-wave order is strongly suppressed by the local ordered moments.

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