



Weekly Seminar

Some interesting issues about the transport properties of two-dimensional superconductors

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Time: 3:00pm, Oct. 13, 2021 (Wednesday)

时间: 2021年10月13日 (周三) 下午3:00

Venue: Room W563, Physics building, Peking University

地点: 北京大学物理楼, 西563会议室

Abstract

In the first part of this talk, I will show our theoretical attempts to study the in-plane critical magnetic field of two-dimensional Ising superconducting systems and propose a microscopic theory for these systems with or without inversion symmetry, which has treated the impurity scattering and Rashba spin orbital scattering on equal footing [1, 2]. The microscopic theory is consistent with recent experimental results in Pb [3, 4] and stanine [5] superconducting ultra-thin films and so on.

In the second part of this talk, I will introduce the intriguing Ohmic dissipation effect on the transport property of two-dimensional disordered superconductor. Specifically, the Ohmic dissipation gives rise to Quantum Griffiths singularity in superconductor-metal transition systems [6-8], while leads to a bosonic strange metal behavior around the critical resistance of superconductor-insulator transition in 2D nano-patterned YBCO films [9].

References:

- [1] H.C. Liu, H. Liu, D. Zhang, X. C. Xie, Phys. Rev. B 102, 174510 (2020).
- [2] H Ji, H. Liu, H. Jiang, X. C. Xie, Advances in Physics: X 6, 1884133 (2021).
- [3] Y. Liu, et al., Physical Review X 8, 021002 (2018).
- [4] Y. Liu, et al., Nature Communications 10, 3633 (2019).
- [5] J. Falson, et al., Science 367, 1454 (2020).
- [6] Y. Xing, et al, Science 350 542, (2015).
- [7] Y. Liu, et al., Phys. Rev. Lett.127, 137001 (2021).
- [8] C. Huang, et al., arXiv:2010.12775
- [9] C. Yang, et al., arXiv:2105.02654.

About the speaker

Haiwen Liu has obtained his bachelor degree from the school of Physics, PKU in 2006, and doctor degree from the Institute of Physics, CAS in 2012. During 2012 to 2015, he is a postdoctoral researcher at ICQM, PKU. Since 2016, he is a research professor in the department of Physics, Beijing Normal University. His recent research interests include the disorder and dissipation effects on the quantum transport properties of superconducting and topological systems.