



量子物理学・ナノサイエンス第 41 回特別セミナー

Spin freezing and unconventional superconductivity

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概要

Multiorbital Hubbard systems with Hund coupling exhibit a sharp crossover, as a function of filling or interaction, between a conventional metal state and a non-Fermi liquid metal state with frozen magnetic moments. The fluctuating local moments at the border of this spin-frozen regime induce an instability to a spin-triplet superconducting phase [1]. In multiorbital systems with effectively negative Hund coupling, there is a closely related orbital freezing phenomenon, which is connected to an unconventional type of spin-singlet superconductivity realized in fulleride compounds [2]. In this talk, I will use dynamical mean field simulations to illustrate and discuss these phenomena. By a suitable basis transformation, one can even connect the d-wave superconducting instability in the 2D Hubbard model to a spin-freezing phenomenon [3].

[1] S. Hoshino and P. Werner, Phys. Rev. Lett. **115**, 247001 (2015)

[2] K. Steiner, S. Hoshino, Y. Nomura, and P. Werner, Phys. Rev. B **94**, 075107 (2016)

[3] P. Werner, S. Hoshino, and H. Shinaoka, Phys. Rev. B **94**, 245134 (2016)

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