Unequivocal Identification of Spin-Triplet and Spin-Singlet Superconductors with Upper Critical Field and Flux Quantization

Superconductors (SCs) hold spin-singlet or spin-triplet pairings. The majority of known SCs are the spin-singlet. Spin-triplet SCs, essential for Majorana Fermions and fault-tolerant quantum computing, are very rare and difficult to identify. This study is the first unequivocal demonstration of identifying singlet and triplet SCs via two methods–kink-point in the upper critical field and half-quantum flux. Chiang *et al*. demonstrated that spin-triplet SCs can be clearly and reliably identified with these two methods, which is beneficial for exploring triplet SCs and developing quantum computation.

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https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.131.236003

Anomalous Nernst Effect Induced Terahertz Emission in a Single Ferromagnetic Film

In this study, by developing a bidirectional pump-THz emission spectroscopy and associated symmetry analysis method, we set a benchmark for the experimental distinction of the THz emission induced by various mechanisms. Our results unveil a new mechanism of anomalous Nernst effect (ANE) induced THz emission due to the ultrafast temperature gradient created by a femtosecond laser. Our work not only clarifies the origin of the ferromagnetic-based THz emission but also offers a fertile platform for investigating the ultrafast optomagnetism and THz spintronics.

Zheng Feng,* Wei Tan, Zuanming Jin,* Yi-Jia Chen, Zhangfeng Zhong, Liang Zhang, Song Sun, Jin Tang, Yexing Jiang, Po-Hsun Wu, Jun Cheng, Bingfeng Miao,* Haifeng Ding, Dacheng Wang, Yiming Zhu, Liang Guo, Sunmi Shin, Guo-Hong Ma, Dazhi Hou, and Ssu-Yen Huang*, "Anomalous Nernst Effect Induced Terahertz Emission in a Single Ferromagnetic Film," Nano letters. **23**, 8171 (2023).

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