

On the Pursuit of Majorana Fermion in Fe (Te,Se)

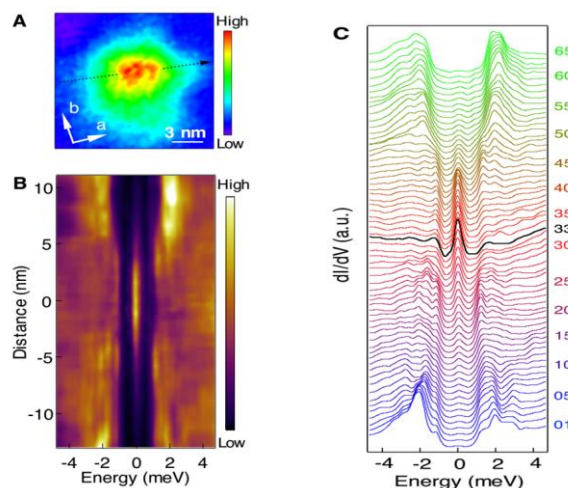
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Abstract

Majorana fermion, with its potential application on topological quantum computation, attracts lots of research attention. Although it has not been found in the high energy physics, recent experiments show evidence of Majorana fermions in condensed matter. In this report, we will first discuss how a vortex on the surface of a superconductor can host Majorana bound state. Then we will introduce the topological superconductivity on surface of Fe(Te,Se). Using low temperature and high magnetic field STM, evidence of Majorana bound state are found at the vortex core on the surface [1]. Furthermore, using spin-polarized STM we observed spin-polarized Yu-Shiba-Rusinov state as well as none spin-polarized zero bias peak [2]. Our results demonstrate the importance using combination of different measuring techniques to identify Majorana fermion.



Pic.1 Spatially non-split zero bias peak as evidence of Majorana bound state

Bibliography

[1] D. Wang et al., Science 360, 6385,182 (2018)

[2] D. Wang et al., Phys. Rev. Lett. 126, 076802 (2021)