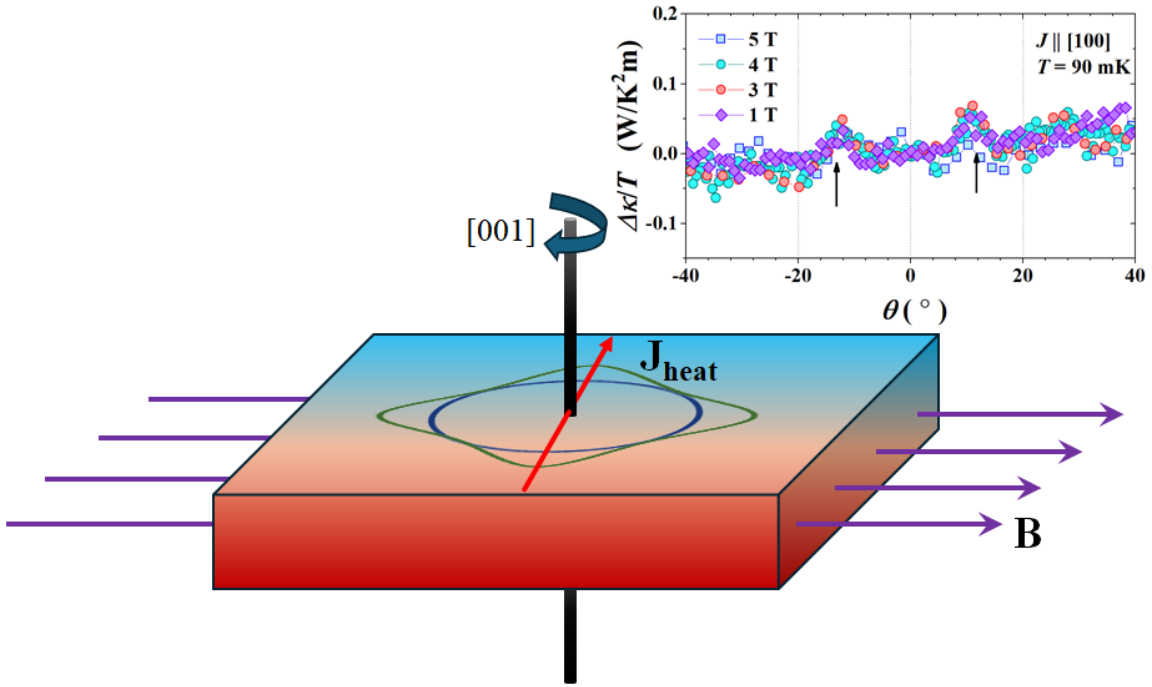
Revealing Normal Fermi Surface In Superconductors

Scientific Achievement

Identification of uncondensed Landau quasiparticles inside the superconducting phase through the quantum oscillation in thermal conductivity.



Quantum oscillation in superconducting state.

Significance and Impact

Novel identification of the normal Fermi surface within a superconductor.

Research Details

- Distinct resonance in thermal conductivity when a magnetic field is applied at specific angles.
- Observed resonances are attributed to the emergence of uncondensed Landau quasiparticles in the superconducting state.
- Theory calculations reveal several sharp peaks in the density of states as the magnetic field's direction is varied, consistent with the experiment.

Lee, S.; Kim, D. Y.; Rosa, P. F. S.; Bauer, E. D.; Ronning, F.; Thompson, J. D.; Lin, S.-Z.; Movshovich, R. Normal Fermi Surface in the Nodal Superconductor. *Physical Review Letters* 2024, 132 (23). DOI:10.1103/physrevlett.132.236002.

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