

Fermiology of superconductors

Keywords: Fermi surface, Quantum oscillations, iron-based superconductors

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Background

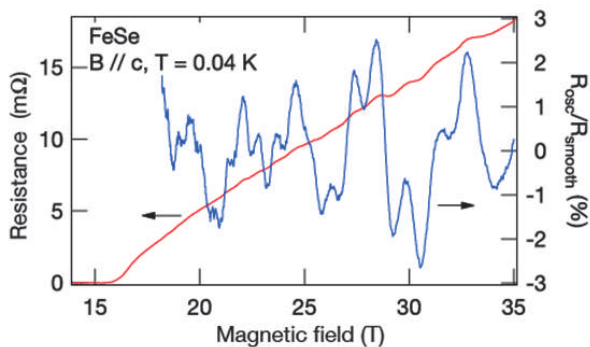
- Materials with high superconducting transition temperatures can have many applications. Knowledge of electronic structures of existing superconductors can help a search for new ones with higher transition temperatures.

Aim

- By using high magnetic fields up to 20 T and low temperatures down to 0.03 K, we perform quantum oscillation measurements on superconductors such as iron-based ones and determine their Fermi surfaces.

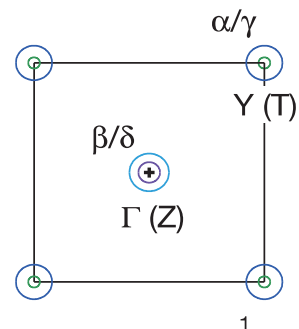
Advanced Research Topics

Quantum oscillations in FeSe



Iron-based superconductors
Various types such as
11, 122, 1111, 112, etc.

Fermi surface



Quantum oscillation measurements on
Iron-based superconductors



Electronic structures, superconducting mechanisms

Publications

- T. Terashima et al., Phys. Rev. X 8, 011014 (2018).
- T. Terashima et al., Phys. Rev. B 93, 180503(R) (2016).
- T. Terashima et al., Phys. Rev. B 93, 094505 (2016).

Summary

- Quantum oscillation measurements in high magnetic fields at low temperatures
- Fermi surface
- Electronic structure of iron-based superconductors

Research outcome

- Elucidation of the superconducting mechanism of the iron-based superconductors
- Guide to a search for new superconductors with higher transition temperatures