

Yasui Yuuki

Kyoto University

Title:

Search for Half-Quantum-Fluxoid States in a Micro-Ring of Sr<sub>2</sub>RuO<sub>4</sub>

Abstract:

"Sr<sub>2</sub>RuO<sub>4</sub> is a leading candidate for spin-triplet superconductor. It is thought its state of cooper pairs is equal spin pairing (ESP), which is expressed by the superposition of  $\uparrow\uparrow$  and  $\downarrow\downarrow$ .

In general, fluxoids which penetrate superconductor rings are quantized because of the single-valuedness of the order parameter.

However for Sr<sub>2</sub>RuO<sub>4</sub>, its two degrees of freedom in phase, orbital and spin, allow fluxoid to penetrate half-amount of flux quantum.

We call this Half-Quantum Fluxoid (HQF).

Observation of HQF is important since HQF is an evidence of spin-triplet ESP state.

Oscillations in critical temperature and magnetoresistance which is caused by fluxoid quantization are known for Little-Parks oscillation.

We want to measure this oscillation.

We made small Sr<sub>2</sub>RuO<sub>4</sub> ring with focused ion beam machine, and measured resistance of the Sr<sub>2</sub>RuO<sub>4</sub> ring under magnetic field.

We observed periodic oscillations whose period and amplitude are same as those which are predicted by theory.

We are going to measure magnetoresistance with in-plane field to detect HQF."