



## Studying the effects of trapped magnetic fields on current flow in a multifilamentary YBCO superconductor using polarized neutron imaging.

Wednesday 22 March 2023 11:50 (20 minutes)

This study aims to investigate the changes in superconducting current flow induced by a trapped magnetic field. This is done by using polarized neutrons to image both the trapped magnetic field and the screening field induced by the current flow.

The experiment was conducted at the J-PARC RADEN facility on a multifilamentary YBCO superconductor [1] with a 1T field applied along the current flow path, trapped at 5K. Measurements were performed both with and without an applied current of 1Amp.

Using polarized neutrons [2] the trapped field can be directly imaged, and by assuming a local unidirectional current flow, the current can be piece-wise reconstructed from the measured screening field.

The presentation will give an overview of the experiment along with data analysis procedures. As a result, the effect of screening currents on the current flow behavior and its response to a trapped magnetic field inside the current path, can be directly investigated for a better understanding of internal current flow in superconductors.

[1] Wulff, A. C., Abrahamsen, A. B., & Insinga, A. R. (2021). Multifilamentary coated conductors for ultra-high magnetic field applications. In Superconductor Science and Technology (34, 5). IOP Publishing Ltd. <https://doi.org/10.1088/1361-6668/abee2b>

[2] Takenao Shinohara et al 2017 J. Phys.: Conf. Ser. 862 012025

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**Session Classification:** Superconductors

**Track Classification:** Magnetism, Superconductivity, Topological Systems, Magnetic Thin Films and other electronic phenomena