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Personal

Born on May 22, 1986 in Nara Prefecture.

Japan Citizen.

Education

Eng.D. Mar. 2015, Osaka Prefecture University, Sakai, Japan
(Supervisor: Prof. Masaru Kato).

“Theoretical study for identifying unconventional superconductivity through vortex core bound states”

M.E. Mar. 2012, Osaka Prefecture University, Sakai, Japan
(Supervisor: Prof. Nobuhiko Hayashi).

“Theory for phase-sensitive flux-flow resistivity in unconventional superconductors” (in Japanese)

B.E. Mar. 2010, Osaka Prefecture University, Sakai, Japan
(Supervisor: Prof. Nobuhiko Hayashi).

Research Areas / Interests

Phenomenological theory of superconductivity,
especially, “Spatially Inhomogeneous” superconducting systems

Unconventional Superconductivity

Vortex Structure in Superconductors

Vortex Dynamics

Noncentrosymmetric Superconductors

Appointments

1 Apr. 2020 - present: Researcher, Research Institute for Advanced Electronics and Photonics, National Institute of Advanced Industrial Science and Technology (AIST)

1 Feb. 2017 - 31 Mar. 2020: AIST Postdoctoral Researcher, Electronics and Photonics Research Institute, National Institute of Advanced Industrial Science and Technology (AIST)

1 Apr. 2015 - 26 Dec. 2016: Postdoctoral Researcher, Institute of Basic Science, Sungkyunkwan University (with Prof. Jung Hoon Han).

1 Apr. 2010 - 31 Jul. 2013: Research Assistant, Research Organization for the 21st Century, Osaka Prefecture University (with Prof. Nobuhiko Hayashi).

Memberships

Member of The Physical Society of Japan, June 2010 - present.

Member of The Japan Society of Applied Physics, June 2017 - present.

Member of The Cryogenics and Superconductivity Society of Japan, Mar. 2017 - present.

Publications

- [1] Yoichi Higashi and Yasunori Mawatari, “Efficient Numerical Modeling of the Magnetization Loss on a Helically Wound Superconducting Tape in a Ramped Magnetic Field”, *IEEE Trans. Appl. Supercond.* **30**, 8200207 (2020).
- [2] Takashi Yanagisawa, Yoichi Higashi, and Izumi Hase, “Fractional Skyrmion and Absence of Low-lying Andreev Bound States in a Micro Fractional-flux Quantum Vortex”, *J. Phys. Soc. Jpn* **88**, 104704 (2019).
- [3] Yoichi Higashi and Yasunori Mawatari, “Electromagnetic coupling of twisted multi-filament superconducting tapes in a ramped magnetic field”, *Supercond. Sci. Technol.* **32**, 055010 (2019).
- [4] Yoichi Higashi, Huiming Zhang, and Yasunori Mawatari, “Analysis of Magnetization Loss on a Twisted Superconducting Strip in a Constantly Ramped Magnetic Field”, *IEEE Trans. Appl. Supercond.* **29**, 8200207 (2019).
- [5] Yun-Tak Oh, Yoichi Higashi, Ching-Kit Chan, and Jung Hoon Han, “Adiabatic Green’s function technique and the transient behavior in time-dependent fermion-boson coupled models”, *Phys. Rev. B* **94**, 075113 (2016).
- [6] Y. Higashi, Y. Nagai, T. Yoshida, Y. Masaki, and Y. Yanase, “Robust zero-energy bound states around a pair-density-wave vortex core in locally noncentrosymmetric superconductors”, *Phys. Rev. B* **93**, 104529 (2016).
- [7] Y. Higashi, Y. Nagai, T. Yoshida, M. Kato, and Y. Yanase, “Excitation spectra and wave functions of quasiparticle bound states in bilayer Rashba superconductors”, *Physica C* **518**, 1 (2015).
- [8] Y. Higashi, Y. Nagai, T. Yoshida, and Y. Yanase, “Vortex Core Structure in Multilayered Rashba Superconductors”, *J. Phys.: Conf. Ser.* **568**, 022018 (2014).

- [9] Y. Higashi, Y. Nagai, and N. Hayashi,
“Impurity Effect on the Local Density of States around a Vortex in Noncentrosymmetric Superconductors”,
JPS Conf. Proc. **3**, 015003 (2014).
- [10] Y. Higashi, Y. Nagai, M. Machida, and N. Hayashi,
“Field-angle Resolved Flux-flow Resistivity as a Phase-sensitive Probe of Unconventional Cooper Pairing”,
Phys. Rev. B **88**, 224511 (2013).
- [11] Y. Higashi, Y. Nagai, M. Machida, and N. Hayashi,
“Effect of anisotropic Fermi surface on the flux-flow resistivity under rotating magnetic field”,
Phys. Proc. **45**, 137 (2013).
- [12] N. Hayashi, Y. Higashi, N. Nakai, and H. Suematsu,
“Effect of Born and unitary impurity scattering on the Kramer-Pesch shrinkage of a vortex core in an s-wave superconductor”,
Physica C **484**, 69 (2013).
- [13] Y. Higashi, Y. Nagai, M. Machida, and N. Hayashi,
“Effect of uniaxially anisotropic Fermi surface on the quasiparticle scattering inside a vortex core in unconventional superconductors”,
Physica C **484**, 97 (2013).
- [14] Y. Higashi, Y. Nagai, M. Machida, and N. Hayashi,
“Phase-Sensitive Flux-Flow resistivity in Unconventional Superconductors”,
J. Phys.: Conf. Ser. **400**, 022025 (2012).
- [15] Y. Higashi, Y. Nagai, M. Machida, and N. Hayashi,
“Field-angle dependence of the quasiparticle scattering inside a vortex core in unconventional superconductors”,
Physica C **471**, 828-830 (2011).
- [16] N. Hayashi, Y. Nagai, and Y. Higashi,
“Analysis of field-angle dependent specific heat in unconventional superconductors: a comparison between Doppler-shift method and Kramer-Pesch approximation”,
Physica C **470**, S865-S867 (2010).

Presentations

- [17] Yoichi Higashi, Akira Miyazaki and Yasunori Mawatari: (poster)
“Dissipative conductivity in moderately clean superconductors”,
The 14th European Conference on Applied Superconductivity (EUCAS2019),
Glasgow (United Kingdom), 2 September 2019 [1-MP-EP-11S].
- [18] Yoichi Higashi and Yasunori Mawatari: (poster)
“Electromagnetic coupling of multifilamentary helically-wound superconducting tapes in a rapidly swept magnetic field”,
The 31th International Symposium on Superconductivity (ISS2018),
Tsukuba (Japan), 12 December 2018 [WBP4-4].
- [19] Yoichi Higashi and Yasunori Mawatari: (oral)
“Electromagnetic coupling of twisted multifilamentary superconducting tape wires in a constantly ramped

- magnetic field”,
2018 Applied Superconductivity Conference (ASC2018),
Seattle (United States), 29 October 2018 [1MOr1A-05].
- [20] Yoichi Higashi and Yasunori Mawatari: (oral)
“Analysis of magnetization loss on a helically wound superconducting tape in a ramping magnetic field”,
6th International Workshop on Numerical Modelling of High Temperature Superconductors,
Caparica (Portugal), 29 June 2018 [O6-16].
- [21] Yoichi Higashi, Huiming Zhang, Yasunori Mawatari: (invited)
“Analysis of Macroscopic Electromagnetic Response on a Twisted Superconducting Strip in Constantly
Ramping Magnetic Fields”,
Collaborative Conference on Superconductivity,
Singapore, 17 January 2018.
- [22] Yasunori Mawatari, Yoichi Higashi: (oral)
“Simple analytical formulae to evaluate the irregular field in solenoid coils with high-temperature su-
perconducting tape wires”,
CHATS on Applied Superconductivity 2017,
Sendai (Japan), 10 - 12 December 2017.
- [23] Yoichi Higashi, Yasunori Mawatari: (poster)
“Electromagnetic Coupling of Multi-Filamentary Superconducting Tape Wires in Ramping Magnetic
Fields”,
The 30th International Symposium on Superconductivity (ISS2017),
Tokyo (Japan), 13 December 2017 [WBP6-4].
- [24] Yoichi Higashi, Huiming Zhang, Yasunori Mawatari: (poster)
“Analysis of Magnetization and Loss on a Twisted Superconducting Tape Wire in a Constantly Ramping
Magnetic Field”,
The 30th International Symposium on Superconductivity (ISS2017),
Tokyo (Japan), 13 December 2017 [WBP6-3].
- [25] Yasunori Mawatari¹, Yoichi Higashi: (poster)
“Theoretical evaluation of the screening-current-induced field in HTS coils with tape wires”,
The13th European Conference on Applied Superconductivity (EUCAS2017),
Geneva (Switzerland), 17 - 21 September 2017 [1MP5-08].
- [26] Yoichi Higashi, Huiming Zhang, Yasunori Mawatari: (poster)
“Electromagnetic field analysis of a twisted superconducting strip with sweeping magnetic field”,
The13th European Conference on Applied Superconductivity (EUCAS2017),
Geneva (Switzerland), 17 - 21 September 2017 [1MP5-02].
- [27] Y. Higashi, Y. Nagai, T. Yoshida, M. Kato, Y. Yanase: (oral)
“Excitation Spectra and Wave Functions of Quasiparticle Bound States in Bilayer Rashba Supercon-
ductors”,
The 27th International Symposium on Superconductivity (ISS2014),
Tokyo (Japan), 25 - 27 November 2014.
- [28] Y. Higashi, Y. Nagai, T. Yoshida, Y. Yanase: (poster)
“Vortex Core Structure in Multilayered Rashba Superconductors”,
The 27th International Conference on Low Temperature Physics (LT27),
Buenos Aires (Argentina), 6 - 13 August 2014.

¹presenter

- [29] T. Yamane², Y. Higashi, M. Kato, Y. Nagai, K. Tanaka, N. Hayashi: (poster)
“Impurity scattering effect on the local density of states around a multi-quantum vortex”,
The 26th International Symposium on Superconductivity (ISS2013),
Tokyo (Japan), 18 - 20 November 2013.
- [30] Y. Higashi, Y. Nagai, N. Hayashi: (poster)
“Impurity Effect on the Local Density of States around a Vortex in Noncentrosymmetric Superconductors”,
The International Conference on Strongly Correlated Electron Systems 2013 (SCES2013),
Tokyo (Japan), 5 - 9 August 2013.
- [31] Y. Higashi, Y. Nagai, M. Machida, N. Hayashi: (poster)
“Effect of anisotropic Fermi surface on the flux-flow resistivity under rotating magnetic field”,
The 25th International Symposium on Superconductivity (ISS2012),
Tokyo (Japan), 3 - 5 December 2012.
- [32] Y. Higashi, Y. Nagai, M. Machida, N. Hayashi: (poster)
“Effect of uniaxially anisotropic Fermi surface on the quasiparticle scattering inside a vortex core in unconventional superconductors”,
The 24th International Symposium on Superconductivity (ISS2011),
Tokyo (Japan), 24 - 26 October 2011.
- [33] Y. Higashi, Y. Nagai, M. Machida, N. Hayashi: (poster)
“Phase-Sensitive Quasiparticle Scattering inside a Vortex Core in Unconventional Superconductors”,
The 26th International Conference on Low Temperature Physics (LT26),
Beijing (China), 10 - 17 August 2011.
- [34] Y. Higashi, Y. Nagai, M. Machida, N. Hayashi: (poster)
“Field-Angle Dependence of the Quasiparticle Scattering inside a Vortex Core in Unconventional Superconductors”,
The 23th International Symposium on Superconductivity (ISS2010),
Tsukuba (Japan), 1 - 3 November 2010.

²presenter