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原著論文 (10)

[10] **Zhiping Bian**, Mitsuki Yoshimura, Ahrong Jeong, Haobo Li, Takashi Endo, Yasutaka Matsuo, Yusaku Magari, Hidekazu Tanaka, Hiromichi Ohta*, "Solid-State Electrochemical Thermal Switches with Large Thermal Conductivity Switching Widths", *Adv. Sci.* 2401331 (2024). (June 25, 2024) (DOI: [10.1002/advs.202401331](https://doi.org/10.1002/advs.202401331)) **Open Access**

[9] Hao-Bo Li*, **Zhiping Bian**, Mitsuki Yoshimura, Kohei Shimoyama, Chengchao Zhong, Keiji Shimoda, Azusa N. Hattori, Kunihiko Yamauchi, Ikutaro Hamada, Hiromichi Ohta*, Hidekazu Tanaka*, "Wide-range thermal conductivity modulation based on protonated nickelate perovskite oxides", *Appl. Phys. Lett.* 124, 191901 (2024). (May 8, 2024) (DOI: [10.1063/5.0201268](https://doi.org/10.1063/5.0201268))

[8] Mitsuki Yoshimura, Qian Yang, **Zhiping Bian**, and Hiromichi Ohta*, "Significant Reduction in the Switching Time of Solid-State Electrochemical Thermal Transistors", *ACS Appl. Electron. Mater.* 5, 4233 (2023). (July 24, 2023) (DOI: [10.1021/acsaelm.3c00512](https://doi.org/10.1021/acsaelm.3c00512))

[7] **Zhiping Bian***, Qian Yang, Mitsuki Yoshimura, Hai Jun Cho, Joonhyuk Lee, Hyoungjeen Jeon, Takashi Endo, Yasutaka Matsuo, and Hiromichi Ohta*, "Solid-State Electrochemical Thermal Transistors with Strontium Cobaltite – Strontium Ferrite Solid Solutions as the Active Layers", *ACS Appl. Mater. Interfaces* 15, 23512–23517 (2023). (May 3, 2023) (DOI: [10.1021/acsaemi.3c03660](https://doi.org/10.1021/acsaemi.3c03660))

[6] Qian Yang, Hai Jun Cho, **Zhiping Bian**, Mitsuki Yoshimura, Joonhyuk Lee, Hyoungjeen Jeon, Jinghuang Lin, Jiake Wei, Bin Feng, Yuichi Ikuhara, and Hiromichi Ohta*, "Solid-State Electrochemical Thermal Transistors", *Adv. Funct. Mater.* 33, 2214939 (2023). (February 21, 2023) (DOI: [10.1002/adfm.202214939](https://doi.org/10.1002/adfm.202214939)) **Open Access**

[5] Mei Ying Liu, Jun Xi Yu, Xiao Li Zhu, **Zhi Ping Bian**, Xiang Zhou, Yu Hang Liang, Zhen Lin Luo, Yue Wei Yin, Jiang Yu Li, and Xiang Ming Chen, "Hexagonal Lu_{1-x}In_xFeO₃ Room-Temperature Multiferroic Thin Films", *ACS Appl. Mater. Interfaces* 14, 52117–52123 (2022). (DOI: [10.1021/acsaemi.2c11927](https://doi.org/10.1021/acsaemi.2c11927))

[4] Mei Ying Liu, Tu Lai Sun, Ting Ting Gao, **Zhi Ping Bian**, Zhen Lin Luo, Xiao Qiang Liu, and Xiang Ming Chen, "Robust room-temperature ferroelectricity and

magnetoelectric coupling effect in epitaxial $\text{CaTiO}_3/\text{SmFeO}_3$ thin films”, *J. Am. Ceram. Soc.* 105, 7558-7566 (2022). (DOI: [10.1111/jace.18736](https://doi.org/10.1111/jace.18736))

[3] **Zhiping Bian**, Jiangtao Zhao, Heng Cao, Yongqi Dong, and Zhenlin Luo, “Reversible Rapid Hydrogen Doping of WO_3 in Non-Acid Solution”, *ACS Appl. Mater. Interfaces* 13, 13419-13424 (2021). (DOI: [10.1021/acsami.1c01165](https://doi.org/10.1021/acsami.1c01165))

[2] Tao Yu, Bei Deng, Liang Zhou, Pingbo Chen, Qiyang Liu, Cailin Wang, Xingkun Ning, Jingtian Zhou, **Zhiping Bian**, Zhenlin Luo, Chunyin Qiu, Xing-Qiang Shi, and Hongtao He, “Polarity and Spin–Orbit Coupling Induced Strong Interfacial Exchange Coupling: An Asymmetric Charge Transfer in Iridate–Manganite Heterostructure”, *ACS Appl. Mater. Interfaces* 11, 44837-44843 (2019). (DOI: [10.1021/acsami.9b14641](https://doi.org/10.1021/acsami.9b14641))

[1] **Z.P. Bian**, D.S. Li, X. Zhao, H. Lin, “Multi-peak emissions of Pr^{3+} -doped heavy metal tellurite glasses for laser-driven illumination”, *Radiation Physics and Chemistry* 151, 126-132 (2018). (DOI: [10.1016/j.radphyschem.2018.05.029](https://doi.org/10.1016/j.radphyschem.2018.05.029))

学会発表 (17)

[17] **Zhiping Bian**, Mitsuki Yoshimura, Ahrong Jeong, Haobo Li, Takashi Endo, Yasutaka Matsuo, Yusaku Magari, Hidekazu Tanaka, Hiromichi Ohta, “Solid-State Electrochemical Thermal Transistors with Large Thermal Conductivity Switching Widths”, 2024年 第71回 応用物理学会春季学術講演会, 東京都市大学 世田谷キャンパス, 東京, 2024年3月22日-25日.

[16] **Zhiping Bian**, Mitsuki Yoshimura, Ahrong Jeong, Hiromichi Ohta, “[A4-O202-06] Absence of High On-to-Off Thermal Conductivity Ratio in the $\text{La}_x\text{Sr}_{1-x}\text{CoO}_y$ -based Thermal Transistors”, MRM2023, Kyoto, Japan, December 11-16, 2023. (oral)

[15] **Zhiping Bian**, Mitsuki Yoshimura, Qian Yang, Hai Jun Cho, Joonhyuk Lee, Hyoungjeen Jeon, Takashi Endo, Yasutaka Matsuo, Hiromichi Ohta, “Solid-State Electrochemical Thermal Transistors with Perovskite Cobalt Oxide-based Solid Solutions as the Active Layers”, The 2023 RIES-CEFMS (Research Institute for Electronic Science – Center for Emergent Functional Matter Science) Joint International Symposium, Rusutsu Resort Hotel and Convention Center, Japan,

December 7-8, 2023. (Poster)

[14] **Zhiping Bian**, Mitsuki Yoshimura, Qian Yang, Hai Jun Cho, Joonhyuk Lee, Hyoungjeen Jeon, Takashi Endo, Yasutaka Matsuo, and Hiromichi Ohta, "Solid-State Electrochemical Thermal Transistors with Perovskite Cobaltate-based Solid Solutions as the Active Layers", [The 24th RIES-HOKUDAI International Symposium 開 \[kai\]](#), Hokkaido University, Sapporo, Japan, December 6-7, 2023.

[13] **Zhiping Bian**, Mitsuki Yoshimura, Qian Yang, Hai Jun Cho, Joonhyuk Lee, Hyoungjeen Jeon, Takashi Endo, Yasutaka Matsuo, and Hiromichi Ohta, "Solid-state electrochemical thermal transistors with perovskite cobalt oxide-based solid solutions as the active layers", [The Mini-Workshop on Functional Materials Science \(Organizers' meeting\)](#), Sapporo, Japan, December 1-2, 2023. (Poster)

[12] **Zhiping Bian**, Mitsuki Yoshimura, Qian Yang, Hai Jun Cho, Joonhyuk Lee, Hyoungjeen Jeon, Takashi Endo, Yasutaka Matsuo, and Hiromichi Ohta, "Solid-State Electrochemical Thermal Transistors with Perovskite Cobalt Oxide-based Solid Solutions as the Active Layers", [29th International Workshop on Oxide Electronics \(iWOE29\)](#), Busan, Korea, October 15-18, 2023. (Poster)

[11] **Zhiping Bian**, Mitsuki Yoshimura, Ahrong Jeong, Hiromichi Ohta, "Absence of High On-to-Off Thermal Conductivity Ratio in the $\text{La}_x\text{Sr}_{1-x}\text{CoO}_y$ -based Thermal Transistors", [第 84 回 応用物理学会秋季学術講演会「イオントロンクスにおける酸化物・カルコゲナイトの新機能」](#), 熊本城ホールほか 3 会場, 2023 年 9 月 19 日-23 日

[10] **Zhiping Bian**, Qian Yang, Mitsuki Yoshimura, Hai Jun Cho, Joonhyuk Lee, Hyoungjeen Jeon, Takashi Endo, Yasutaka Matsuo, and Hiromichi Ohta, "Thermal Conductivity Modulation of SrCoO_y - SrFeO_y Solid Solution in Solid-State Electrochemical Thermal Transistors", [The 4th Workshop on Functional Materials Science \(FMS2023\)](#), Busan, South Korea, June 18-21, 2023. (poster)

[9] **卞 志平**, 太田裕道, "全固体電気化学熱トランジスタの活性層 II: SrCoO_x - SrRuO_x 固溶体", [第 70 回 応用物理学会 春季学術講演会](#), 上智大学 四谷キャンパス+オンライン, 2023 年 3 月 15 日-18 日

[8] **卞 志平**, 楊 倩, 吉村充生, イジュンヤク, ジンヒョンジン, 林 景煌, 馮 斌, 幾原雄一, ショ

ヘジユン, 太田裕道, “全固体電気化学熱トランジスタの活性層 I : $\text{SrCoO}_x\text{-SrFeO}_x$ 固溶体”, “全固体電気化学熱トランジスタ”, [第 70 回 応用物理学会 春季学術講演会](#), 上智大学 四谷キャンパス+オンライン, 2023 年 3 月 15 日-18 日

[7] **Zhiping Bian**, Qian Yang, Mitsuki Yoshimura, Hai Jun Cho, Hiromichi Ohta, “Solid-state Electrochemical Thermal Transistors using $\text{SrCoO}_y\text{-SrFeO}_y$ Solid Solutions”, [7th International Conference on Advances in Functional Materials \(AFM 2023\)](#), Fukuoka, Japan, January 9-12, 2022 (Oral)

[6] **Zhiping Bian**, Qian Yang, Mitsuki Yoshimura, Joonhyuk Lee, Hyungjeen Jeon, Jinghuang Lin, Bin Feng, Yuichi Ikuhara, Hai Jun Cho, and Hiromichi Ohta, “Thermal Conductivity Modulation in $\text{SrCoO}_y\text{-SrFeO}_y$ Solid Solution by Electrochemical Redox Reaction”, [The 23rd RIES-Hokudai International Symposium 拓 \[Taku\]](#), Sapporo, Japan, December 5-6, 2022.

[5] **Zhiping Bian**, Qian Yang, Mitsuki Yoshimura, Joonhyuk Lee, Hyungjeen Jeon, Jinghuang Lin, Bin Feng, Yuichi Ikuhara, Hai Jun Cho, and Hiromichi Ohta, “Solid-State Electrochemical Thermal Transistors based on $\text{Sr}(\text{Co}_{1-x}\text{Fe}_x)\text{O}_y$ ($0 \leq x \leq 1$, $2 \leq y \leq 3$) Films as Active Layers”, [薄膜材料デバイス研究会 第 19 回研究集会 in 京都](#), 龍谷大学響都ホール (京都府京都市), 2022 年 11 月 17 日-18 日.

[4] **Zhiping Bian**, Qian Yang, Mitsuki Yoshimura, Joonhyuk Lee, Hyungjeen Jeon, Jinghuang Lin, Bin Feng, Yuichi Ikuhara, Hai Jun Cho, and Hiromichi Ohta, “Solid-State Electrochemical Thermal Transistors based on $\text{Sr}(\text{Co}_{1-x}\text{Fe}_x)\text{O}_y$ ($0 \leq x \leq 1$, $2 \leq y \leq 3$) Films as Active Layers”, [令和 4 年度日本セラミックス協会東北北海道支部研究発表会](#), 伝国の杜 (山形県米沢市), 2022 年 11 月 10 日-11 日.

[3] **卞 志平**, 楊 倩, 吉村充生, ジョヘジユン, 太田裕道, “ $\text{SrCoO}_x\text{-SrFeO}_x$ 固溶体薄膜の電気化学酸化・還元と熱・電子輸送特性”, [2022 年 第 83 回 応用物理学会秋季学術講演会](#), 東北大学川内北キャンパス+オンライン, 2022 年 9 月 20 日-23 日

[2] **Zhiping Bian**, Jiangtao Zhao, Heng Cao, Yongqi Dong, Zhenlin Luo, “Reversible rapid protonation of WO_3 films in non-acid solution”, 2022 年 第 69 回 応用物理学会春季学術講演会, 青山学院大学 相模原キャンパス+Online, March 22-26, 2022 (Oral).

[1] **Zhiping Bian**, Jiangtao Zhao, Heng Cao, Yongqi Dong, Zhenlin Luo, “Reversible

Rapid Hydrogen Doping of WO₃ in Non-Acid Solutions”, The 22nd RIES-HOKUDAI International Symposium 癒 [Yu], Online, December 6-7, 2021 (Poster).

特許 (1)

[1] 太田裕道, 曲勇作, ジョンアロン, **下志平**, 吉村充生, “熱トランジスタ”, 特願 2024-018066, 2024年2月8日出願

報道等 (62)

- [1] “北大, 全固体電気化学熱トランジスタを開発”, [Optronics Online](#), 2023.2.22
- [2] “北大、熱伝導率を電気スイッチで切り替え 全固体熱トランジスタ開発”, [日刊工業新聞 \(電子版\)](#), 2023.2.24
- [3] “熱伝導率を制御する全固体電気化学熱トランジスタを作製 北海道大学”, [fabcross for エンジニア](#), 2023.2.24
- [4] “北大、実用化可能な全固体電気化学熱トランジスタの作製に成功”, [マイナビニュース](#), 2023.2.24
- [5] “北大、実用化可能な全固体電気化学熱トランジスタの作製に成功”, [Mapion ニュース](#), 2023.2.24
- [6] “熱伝導率を電気スイッチで切り替え、北大が開発「全固体熱トランジスタ」がすごい”, [ニュースイッチ](#), 2023.2.27
- [7] “熱伝導率を電気スイッチで切り替え、北大が開発「全固体熱トランジスタ」がすごい”, [Yahoo!ニュース](#), 2023.2.27
- [8] “熱伝導率を電気スイッチで切り替え、北大が開発「全固体熱トランジスタ」がすごい”, [NEWSPICKS](#), 2023.2.27
- [9] “熱伝導率を電気スイッチで切り替え、北大が開発「全固体熱トランジスタ」がすごい”, [goo ニュース](#), 2023.2.27
- [10] “熱伝導率を電気スイッチで切り替え、北大が開発「全固体熱トランジスタ」がすごい”, [dmenu ニュース](#), 2023.2.27
- [11] “Solid-state thermal transistor demonstrated”, [Science Daily](#), 2023.2.22
- [12] “Solid-state thermal transistor demonstrated”, [Nano Werk](#), 2023.2.22
- [13] “Solid-state thermal transistor demonstrated”, [EurekAlert!](#), 2023.2.22
- [14] “Solid-state thermal transistor demonstrated”, [Bioengineer.org](#), 2023.2.22
- [15] “Scientists develop solid-state electrochemical thermal transistor”, [Technewsboy](#), 2023.2.22
- [16] “Scientists Develop Solid-State Electrochemical Thermal Transistor”, [NEWS AZI](#),

2023.2.22

[17] "Scientists develop solid-state electrochemical thermal transistor", [Today Headline](#), 2023.2.22

[18] "Solid-state thermal transistor demonstrated", [NewsBeezer](#), 2023.2.22

[19] "Solid-state thermal transistor demonstrated", [VERVE TIMES](#), 2023.2.22

[20] "Scientists make solid-state thermal transistor", [Compound Semiconductor Magazine](#), 2023.2.22

[21] "Solid-State Thermal Transistor: The Future of Thermal Management Technology", [AZO MATERIALS](#), 2023.2.22

[22] "Solid-State Thermal Transistor Demonstrated", [Lab Manager](#), 2023.2.22

[23] "Solid-State Thermal Transistor Demonstrated", [RealClear Science](#), 2023.2.22

[24] "Developed Solid State Electrochemical Thermal Transistor", [Optimum Physics](#), 2023.2.22

[25] "Solid-state thermal transistor demonstrated", [One Eye News](#), 2023.2.22

[26] "Solid-state thermal transistor demonstrated", [KNOWLEDIA](#), 2023.2.22

[27] "Solid-state thermal transistor demonstrated", [AlphaGalileo](#), 2023.2.24

[28] "Solid-State Electrochemical Thermal Transistor Without Using Liquid", [Semiconductor Engineering](#), 2023.2.24

[29] "Solid-state thermal transistor demonstrated", [Plato Data Intelligence](#), 2023.2.24

[30] "Scientists develop solid-state electrochemical thermal transistor", [NEWS BREAK](#), 2023.2.23

[31] "Scientists develop solid-state thermoelectric transistors", [News 7F](#), 2022.2.23

[32] "Hokkaido University: Solid-State Thermal Transistor Demonstrated", Targeted News Service, 2023.2.23

[33] "Scientists develop solid-state electrochemical thermal transistor", [Newsbit](#), 2023.2.22

[34] "Solid-State Thermal Transistor Demonstrated", [Eurasia Review](#), 2023.2.22

[35] "Scientists develop solid-state electrochemical thermal transistor", Tech Xplore, 2023.2.22

[36] "Solid-state thermal transistor demonstrated", [asiaresearchnews](#), 2023.2.21

[37] "Solid-state thermal transistor demonstrated", [Mirage News](#), 2023.2.21

[38] "Scientists develop solid-state electrochemical thermal transistor", Techstreet Now, 2023.2.22

[39] "Tranzystor termiczny, jakiego jeszcze nie było. Wykorzystuje się go częściej, niż myślisz", [Chip.pl](#), 2023.2.22

- [40] “Transistor thermique à semi-conducteurs démontré | Alerte Eurek !”, [Posts US News](#), 2023.2.22
- [41] “Criado primeiro transistor termico de estado slido”, [Vision Art News](#), 2023.2.28
- [42] “浅析固态热晶体管开启热管理技术新时代”, [电子发烧友](#), 2023.2.25
- [43] “展示了固态热晶体管”, [0XZX](#), 2023.2.22
- [44] “首个固态電化學熱晶體管問世”, [科技日報](#) 2023.2.22
- [45] “北大、実用化可能な全固体電氣化学熱トランジスタの作製に成功”, [Rakuten Infoseek News](#), 2023.2.24
- [46] “北海道大学などが全固体電氣化学熱トランジスタ、熱伝導率を電氣制御”, [日経クロステック](#), 2023.3.20
- [47] “全固体熱トランジスタの制御幅 3.5 倍…北大、廃熱の高高度利用用提案”, 日刊工業新聞 (2024.07.04)
- [48] “全固体熱トランジスタの制御幅 3.5 倍…北大、廃熱の高高度利用用提案”, ニュースイッチ by 日刊工業新聞 <https://newswitch.jp/p/42142> (2024.07.04)
- [49] “全固体熱トランジスタの制御幅 3.5 倍…北大、廃熱の高高度利用用提案”, 日刊工業新聞 電子版 <https://www.nikkan.co.jp/articles/view/717092> (2024.07.04)
- [50] “全固体熱トランジスタの制御幅 3.5 倍…北大、廃熱の高度利用提案”, Yahoo ニュース <https://news.yahoo.co.jp/articles/7cca9a40a9fc20f496300c2eff89edabc460dd11> (2024.07.05)
- [51] “北海道大学ら、熱トランジスタの高性能化に成功”, EE Times Japan <https://eetimes.itmedia.co.jp/ee/articles/2407/05/news074.html> (2024.07.05)
- [52] “北大など、熱伝導率制御幅を従来比 1.5 倍にした「熱トランジスタ」を開発”, マイナビニュース <https://news.mynavi.jp/techplus/article/20240703-2978616/> (2024.07.03)
- [53] “全固体熱トランジスタの制御幅 3.5 倍…北大、廃熱の高度利用提案”, goo ニュース <https://news.goo.ne.jp/article/newswitch/business/newswitch-42142.html> (2024.07.05)
- [54] “北大など、熱伝導率制御幅を従来比 1.5 倍にした「熱トランジスタ」を開発”, BIGLOBE ニュース https://news.biglobe.ne.jp/it/0703/mnn_240703_9276501371.html (2024.07.03)
- [55] “北大など、熱伝導率制御幅を従来比 1.5 倍にした「熱トランジスタ」を開発”, excite ニュース https://www.excite.co.jp/news/article/Cobs_2785030/image/1/ (2024.07.05)
- [56] “北大など、熱伝導率制御幅を従来比 1.5 倍にした「熱トランジスタ」を開発”, マピオン <https://www.mapion.co.jp/news/column/cobs2785030-1/> (2024.07.03)

- [57] “全固体熱トランジスタの制御幅 3.5 倍…北大、廃熱の高度利用提案”, dmenu ニュース <https://topics.smt.docomo.ne.jp/article/newswitch/business/newswitch-42142>(2024.07.05)
- [58] “北大など、熱伝導率制御幅を従来比 1.5 倍にした「熱トランジスタ」を開発”, Rakuten Infoseek News https://news.infoseek.co.jp/photo/mynavi_2785030/ (2024.07.05)
- [59] “北大など、高性能な全固体熱トランジスタ 廃熱利用に”, NIKKEI Tech Foresight <https://www.nikkei.com/prime/tech-foresight/article/DGXZQOUC1219J0S4A710C2000000> (2024.07.17)
- [60] “熱の伝わりやすさを制御”, 日本経済新聞 (2024.7.30)
- [61] “熱の伝わりやすさを制御、廃熱利用目指す 北大など”, [日本経済新聞オンライン](#) (2024.07.30)
- [62] “平和な用途に”, [日刊工業新聞](#) (2024.07.08)