

門脇研究室 2008年度（平成20年度）研究活動状況
（2008年4月1日～2009年3月31日）

[学術論文]

1. "Direct Observation of Terahertz Electromagnetic Waves Emitted from Intrinsic Josephson Junctions in Single Crystalline $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ ", K. Kadowaki, H. Yamaguchi, K. Kawamata, T. Yamamoto, H. Minami, I. Kakeya, U. Welp, L. Ozyuzer, A. E. Koshelev, C. Kurter, K. E. Gray and W. -K. Kwok, *Physica* **C468** (April, 1st, 2008) 634-639.
2. "Quantum Oscillation of the c-Axis Resistivity due to Entrance of Pancake Vortices into Micro-Fabricated $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ Intrinsic Josephson Junctions", I. Kakeya, K. Fukui, K. Kawamata, T. Yamamoto and K. Kadowaki, *Physica* **C468** (April 1st, 2008) 669-673.
3. "Small-Number Arrays of Intrinsic Josephson Junctions", A. Yurgens, M. Torstensson, L. X. You, T. Bauch, D. Winkler, I. Kakeya and K. Kadowaki, *Physica* **C468** (April 1st, 2008) 674-678.
4. "Interesting Magnetic Behavior from Reduced Titanium Dioxide Nanobelts", S. V. Chong, K. Kadowaki, J. Xia and H. Idriss, *Appl. Phys. Lett.* **92** (June 9th, 2008) 232502(1-3).
5. "Fermi arc in the superconducting state of impurity-doped high-temperature superconductors", T. Sato, K. Terashima, K. Nakayama, S. Souma, T. Takahashi, T. Yamamoto, and K. Kadowaki, *Phys. Rev.* **B78** (No. 10), 100502 (4 Sept., 2008).
6. "Evidence for Pairing above the Transition Temperature of Cuprate Superconductors from the Electronic Dispersion in the Pseudogap Phase", A. Kanigel, U. Chatterjee, M. Randeria, M. R. Norman, G. Koren, K. Kadowaki, and J. C. Campuzano, *Phys. Rev. Lett.* **101**, 137002 (26 Sept., 2008).
7. "Tailoring the Magnetization Behavior of Co-Doped Titanium Dioxide Nanobelts", S. V. Chong, J. Xia, N. Suresh, K. Yamaki and K. Kadowaki, *Solid State Commun.* **148** (No. 7-8) (November, 2008) 345-349.
8. "Magnetic and Transport Studies on Electron-doped $\text{CeFeAsO}_{1-x}\text{F}_x$ Superconductor", S. V. Chong, T. Mochiku, S. Sato and K. Kadowaki, *J. Phys. Soc. Jpn.* **77** (November 27th, 2008) Suppl C, 27-34.
9. "In-Phase Electrodynamics and Terahertz Wave Emission in Extended Intrinsic Josephson Junctions", T. Koyama, H. Matsumoto, M. Machida and K. Kadowaki, *Phys. Rev.* **B79** (March 31st, 2009) 104522(1-12).

[Review]

1. "Scanning SQUID Microscope Study of Vortex States and Phases in Superconducting Mesoscopic Dots, Antidots and Other Structures", T. Nishio, Y. Hata, S. Okayasu, J. Suzuki, S. Nakayama, A. Nagata, A. Odawara, K. Chinone and K. Kadowaki, a chapter of "Handbook of Nanoscience and Nanotechnology", Oxford University Press, printing (to be published in March 2009).
2. "Novel Superconducting States in Nanoscale Superconductors", A. Kanda, Y. Ootuka, K. Kadowaki and F. M. Peeters, a chapter of "Handbook of Nanoscience and Nanotechnology", Oxford University Press,

printing (to be published in March 2009).

[雑誌、新聞記事など、その他の著作物]

1. 山口勇人、川又晃平、八巻和宏、辻本学、南英俊、服部利明、掛谷一弘、立木昌、門脇和男、「Bi系高温超伝導体単結晶固有ジョセフソン素子によるテラヘルツ波の連続発振」、FST-NEWS、4月号, No. 117, p5, 2008-4-15 (未踏科学技術協会 超伝導科学技術研究会発行)。
2. 門脇和男、「高温超伝導体で強力なテラヘルツ波の連続発振に成功—テラヘルツ波帯域の新しい光源として応用開発に期待—」、電子情報通信学会会誌「ニュース解説」記事、2008年5月号, vol. 91(2008) No. 5, p432-433.
3. 「生活を変える光の科学①②—未来プロジェクト動く—」、日本経済新聞、2008年4月8日朝刊 011面。
4. 掛谷一弘、南英俊、門脇和男、「高温超伝導体 $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ 固有ジョセフソン接合からの THz 波発振」、(社)電子情報通信学会 信学技報、IEICE Technical Report, SCE2008-21 (2008-07), p37.
5. 門脇和男、「談話室—魅力ある科学をする力はどこから生まれるか?」、応用物理 第77巻 第9号 (2008), p1118.
6. 門脇和男、「高温超伝導体の固有ジョセフソン接合を用いた THz 波発振技術の進展」、超伝導 Web 21 特集：超伝導マイクロ波デバイス技術、超伝導 Web 21, 2009年2月号、p7.

[国際会議招待講演]

1. K. Kadowaki, H. Yamaguchi, K. Yamaki, M. Tsujimoto, T. Yamamoto, H. Minami, T. Hattori, M. Tachiki, H. Matsumoto, T. Koyama, M. Machida, S. Lin, X. Hu, L. Ozyuzer, A. E. Koshelev, C. Kurter, K. E. Gray, W. -K. Kwok and U. Welp, “THz Emission from Intrinsic Josephson Junctions”, presented as an invited talk at the “International Conference on Theoretical Physics, DUBNA-NANO 2008”, July 7-11, 2008, Dubna, Russia.
2. K. Kadowaki, “Summary Talk”, in the Closing Session at the “International Conference on Theoretical Physics, DUBNA-NANO 2008”, July 7-11, 2008, Dubna, Russia.
3. A. E. Koshelev, L. Bulaevskii, L. Ozyuzer, C. Kurter, U. Welp, K. E. Gray, W. K. Kwok, M. Tachiki, K. Kadowaki, T. Yamamoto, H. Minami and H. Yamaguchi, “THz Emission from Intrinsic Josephson Junctions”, presented as an invited talk at the “International Conference on Theoretical Physics, DUBNA-NANO 2008”, July 7-11, 2008, Dubna, Russia.
4. K. Kadowaki, H. Minami, T. Yamamoto, K. Yamaki and M. Tsujimoto, “Josephson LASER Operating in a Layered Superconductor”, presented as an invited talk at the “6th International Symposium on Intrinsic Josephson Effect and Plasma Oscillations in High- T_c Superconductors (PLASMA 2008)”, July 17-19, 2008, POSTECH, Pohang, Korea.
5. I. Kakeya, K. Fukui, T. Yamamoto and K. Kadowaki, “Single Flux-Quantum Penetrations and Josephson Vortex Flow in $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ Mesoscopic Junctions”, presented as an invited talk at the “6th

- International Symposium on Intrinsic Josephson Effect and Plasma Oscillations in High- T_c Superconductors (PLASMA 2008)*”, July 17-19, 2008, POSTECH, Pohang, Korea.
6. R. A. Klemm and K. Kadowaki, “*Angular Dependence of the Radiation Power of a Josephson TASER*”, presented as an invited talk at the “*6th International Symposium on Intrinsic Josephson Effect and Plasma Oscillations in High- T_c Superconductors (PLASMA 2008)*”, July 17-19, 2008, POSTECH, Pohang, Korea.
 7. L. Ozyuzer, C. Kurter, U. Welp, A. E. Koshelev, Q. Li, W. K. Kwok, D. G. Hinks, T. Yamamoto and K. Kadowaki, “*Emission of THz Waves at Locally High Temperatures in Bi2212*”, presented as an invited talk at the “*6th International Symposium on Intrinsic Josephson Effect and Plasma Oscillations in High- T_c Superconductors (PLASMA 2008)*”, July 17-19, 2008, POSTECH, Pohang, Korea.
 8. K. Kadowaki, “*Expanding the Materials World Network; Materials Activities in Japan*”, presented as a Japanese representative of the World Materials Research Network at the Symposium T in the Session T4-S2, IUMRS-ICEM(International Union Materials Research Society – International Conference on Electronic Materials) 2008, held at Hilton Sydney, Australia, 28th July to 1st August, 2008.
 9. K. Kadowaki, “*TASER as Collective Excitation in Layered Superconductors*”, presented as an invited talk at the “*32nd International Workshop on Condensed Matter Theories, in commemoration of the birth centenary of Lev Davidovich Landau 1908-1968*”, held at Loughborough University, United Kingdom, 13-18 August 2008.
 10. K. E. Gray, A. E. Koshelev, C. Kurter, W. –K. Kwok, U. Welp, L. Ozyuzer, K. Kadowaki, T. Yamamoto, H. Minami, H. Yamaguchi, “*Emission of Terahertz Waves from Stacks of Intrinsic Josephson Junctions*”, presented as an invited oral talk at the “*Applied Superconductivity Conference (ASC)*”, held at Hyatt Regency Chicago, Chicago, Illinois, U.S.A., August 17-22, 2008.
 11. K. Kadowaki, H. Yamaguchi, K. Yamaki, M. Tsujimoto, T. Yamamoto, H. Minami, T. Hattori, M. Tachiki, H. Matsumoto, T. Koyama, M. Machida, S. Lin, X. Hu, L. Ozyuzer, A. E. Koshelev, C. Kurter, K. E. Gray, W. –K. Kwok and U. Welp, “*Generation of High Power THz Electromagnetic Waves from High- T_c Superconductor $Bi_2Sr_2CaCu_2O_{8+\delta}$ Intrinsic Josephson Junctions*”, presented as an invited talk at the “*International Conference on Superconductivity and Magnetism (ICSM-2008)*”, 25-29 August 2008, Side-Antalya, Turkey.
 12. K. Kadowaki, K. Yamaki, H. Yamaguchi, M. Tsujimoto, T. Yamamoto, H. Minami, M. Tachiki, S. Fukuya, H. Matsumoto, T. Koyama and R. A. Klemm, “*Josephson LASER, Future Perspective*”, presented as an invited talk at the ESF-JSPS NES program, “*International Workshop on Nanostructured Superconductors: From Fundamentals To Applications*”, Freudenstadt-Lauterbad, Germany, September 13th-17th 2008.
 13. K. Kadowaki, M. Tsujimoto, H. Yamaguchi, K. Yamaki, T. Yamamoto, H. Minami, L. Ozyuzer, A. E. Koshelev, C. Kurter, N. Gopalsami, Q. Li, K. Gray, W. Kwok and U. Welp, “*Intense Continuous THz Emission from High Temperature Superconductor $Bi_2Sr_2CaCu_2O_{8+\delta}$ Single Crystal Mesa Structures*”, presented as an invited talk at the “*Trends in Nanotechnology (TNT 2008)*”, Oviedo, Spain, September

1-5, 2008.

14. K. Kadowaki, “*Superconducting Josephson LASER as Collective Excitations in Layered Superconductors*”, presented as an invited talk at the occasion of “*a Scientific Conference in Honor of Alexei Abrikosov’s 80th Birthday, Vortices at Fifty Years*”, Bldg. 212. Room A-157, Argonne National Laboratory, USA, November 7-8, 2008.
15. K. Kadowaki, “*THz LASER from Various Mesas of Intrinsic Josephson Junctions*”, presented at the “*CTC-NES International Mini Workshop on THz Radiation from Intrinsic Josephson Junctions – The First one Year Anniversary of the Discovery-*”, TKP Ginza Business Center 8th floor B, November 23rd 2008.
16. K. Kadowaki, “*Quantum Electromagnetic Radiation as Superconducting Atoms of Intrinsic Josephson Junctions*”, presented at the “*3rd International Autumn Seminar on Nanoscience and Engineering in Superconductivity for Young Scientists*”, held at Tokyo New Hankyu Hotel Tsukiji, 32nd floor, November 24-30, 2008.
17. K. Kadowaki, H. Yamaguchi, K. Yamaki, M. Tsujimoto, T. Yamamoto, H. Minami, T. Hattori, M. Tachiki, H. Matsumoto, T. Koyama, M. Machida, S. Lin, X. Hu, L. Ozyuzer, A. E. Loshelev, C. Kurter, K. E. Gray, W. –K. Kwok, and U. Welp, “*Generation of THz Waves from High- T_c Superconductor $Bi_2Sr_2CaCu_2O_{8+\delta}$ Intrinsic Josephson Junctions*”, presented as an invited talk at the “*Nanotechnology International Forum, Rusnanotech 08*”, at the Expocenter, Moscow, Russia, December 3-5, 2008.
18. K. Kadowaki, “*THz LASER Emission from Intrinsic Josephson Systems and Vortex Dynamics of Josephson Vortices*”, given as a invited talk at the “*Brazilian School of Superconductivity and Workshop on Frontiers of Superconductivity and Magnetism - Materials, Mechanisms and Applications*”, held in December 8-12, 2008, Summerville Beach Resort, Muro Alto, Pernambuco, Brazil.
19. K. Kadowaki, “*Coherent THz Radiation Emitted from Superconducting Intrinsic Josephson Junctions*”, presented as an invited talk at the “*Joint JSPS-ESF International Conference on Nanoscience and Engineering in Superconductivity*”, held at Okura Frontier Hotel Tsukuba, March 23rd - 26th, 2009.

[国際会議口頭発表]

1. K. Kadowaki, T. Sato, K. Kawamata and J. Mirkovic, “*Collective Excitation Modes in Mesoscopic Intrinsic Josephson Junctions*”, presented as an oral contribution at the ESF-NES Workshop on “*Probing Superconductivity at the Nanoscale*”, Alicante, Spain, June 4-7, 2008.
2. K. Kadowaki, H. Yamaguchi, K. Yamaki, M. Tsujimoto, T. Yamamoto, H. Minami, M. Tachiki, H. Matsumoto and T. Koyama, “*Ac Josephson Laser Working at THz Frequencies in Intrinsic Josephson Junctions*”, presented as an oral talk at the “*International Conference on Low Temperature Physics (LT 25)*”, Amsterdam, The Netherlands, 6-13 August, 2008.
3. A. E. Koshelev, L. Bulaevslii, U. Welp, L. Ozyuzer, C. Cueter, K. E. Gray, W. –K. Kwok, M. Tachiki, K. Kadowaki, T. Yamamoto, H. Minami and H. Yamaguchi, “*Mechanism of Synchronization and Terahertz*

- Josephson Radiation from Layered Superconductors*”, presented as an oral talk at the “*International Conference on Low Temperature Physics (LT 25)*”, Amsterdam, The Netherlands, 6-13 August, 2008.
4. K. Kadowaki, K. Yamaki, H. Yamaguchi, S. Hashimoto, H. Minami, I. Kakeya, T. Yamamoto, M. Tachiki, L. Ozyuzer, A. E. Koshelev, K. E. Gray, W. –K. Kwok, U. Welp and C. Kurter, “*Anisotropic Emission of THz Electromagnetic Waves from Intrinsic Josephson Junction $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_8$ Single Crystals*”, presented as an oral talk at the “*Applied Superconductivity Conference (ASC)*”, held at Hyatt Regency Chicago, Chicago, Illinois, U.S.A., August 17-22, 2008.
 5. C. Kurter, K. E. Gray, J. F. Zasadzinski, L. Ozyuzer, A. E. Koshelev, Q. Li, T. Yamamoto, K. Kadowaki, W. –K. Kwok, M. Tachiki and U. Welp, “*Thermal Management in Large $\text{Bi}2212$ Mesas used for Terahertz Sources*”, presented as an oral talk at the “*Applied Superconductivity Conference (ASC)*”, held at Hyatt Regency Chicago, Chicago, Illinois, U.S.A., August 17-22, 2008.
 6. K. Kadowaki, K. Yamaki, H. Yamaguchi, M. Tsujimoto, T. Yamamoto, H. Minami, I. Kakeya, M. Tachiki, H. Matsumoto, T. Koyama, M. Machida, L. Ozyuzer, A. E. Koshelev, C. Kurter, K. E. Gray, W. –K. Kwok and U. Welp, “*Superconducting THz LASER*”, presented as an oral talk at the “*European Optical Society (EOS) Annual Meeting 2008*”, held in 29 September – 2 October 2008, at the Paris-Nord Villepinte, parc d’expositions et Centre de Conventions – Paris, France.

[国際会議ポスター発表]

1. T. Yamamoto, I. Kakeya and K. Kadowaki, “*Fabrication and Characterization of Small Intrinsic Josephson Junctions from $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ Single Crystals*”, presented at the “*6th International Symposium on Intrinsic Josephson Effect and Plasma Oscillations in High- T_c Superconductors (PLASMA 2008)*”, July 17-19, 2008, POSTECH, Pohang, Korea.
2. M. Tsujimoto, T. Yamamoto, H. Yamaguchi, K. Yamaki, I. Kakeya, H. Minami and K. Kadowaki, “*Fabrication of $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ Mesa Structures for Terahertz Radiation*”, presented at the “*6th International Symposium on Intrinsic Josephson Effect and Plasma Oscillations in High- T_c Superconductors (PLASMA 2008)*”, July 17-19, 2008, POSTECH, Pohang, Korea.
3. H. Yamaguchi, I. Kakeya, H. Minami, M. Tsujimoto, K. Yamaki, T. Yamamoto and K. Kadowaki, “*Emission of Electromagnetic Waves at THz Frequencies Generating Higher Harmonics of THz Emission from Intrinsic Josephson Junctions of $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$* ”, presented at the “*6th International Symposium on Intrinsic Josephson Effect and Plasma Oscillations in High- T_c Superconductors (PLASMA 2008)*”, July 17-19, 2008, POSTECH, Pohang, Korea.
4. K. Yamaki, M. Tsujimoto, H. Yamaguchi, T. Yamamoto, H. Minami and K. Kadowaki, “*Directivity Measurement of THz Emission from Rectangular Mesa of Intrinsic Josephson Junctions*”, presented at the “*6th International Symposium on Intrinsic Josephson Effect and Plasma Oscillations in High- T_c Superconductors (PLASMA 2008)*”, July 17-19, 2008, POSTECH, Pohang, Korea.
5. B. Markovic, K. Yamaki, H. Yamaguchi, M. Tsujimoto, T. Yamamoto, H. Minami, T. Hattori and K.

- Kadowaki, "Experimental Study for THz Electromagnetic Waves Emitted from Intrinsic Josephson Junctions in Single Crystalline $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ ", presented as a poster presentation at the "6th International Symposium on Intrinsic Josephson Effect and Plasma Oscillations in High- T_c Superconductors (PLASMA 2008)", July 17-19, 2008, POSTECH, Pohang, Korea.
6. K. Kadowaki, A. Goya, T. Mochiji and S. V. Chong, "Superconductivity and Magnetism in $\text{REFeAsO}_{1-x}\text{F}_x$ ", presented as a poster presentation at the "International Conference on Low Temperature Physics (LT 25)", Amsterdam, The Netherlands, 6-13 August, 2008.
 7. S. V. Chong and K. Kadowaki, "Superconductivity in Quaternary Yttrium-Oxygen-Iron-Arsenic Compounds", presented as a poster presentation at the "International Conference on Low Temperature Physics (LT 25)", Amsterdam, The Netherlands, 6-13 August, 2008.
 8. U. Welp, L. Ozyuzer, A. E. Koshelev, C. Kurter, M. Tachiki, K. Kadowaki, T. Yamamoto, H. Minami, H. Yamaguchi, K. E. Gray and W. -K. Kwok, "Emission of Coherent THz Radiation from Intrinsic Josephson Junctions in $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_8$ ", presented as a poster presentation at the "International Conference on Low Temperature Physics (LT 25)", Amsterdam, The Netherlands, 6-13 August, 2008.
 9. H. Matsumoto, T. Koyama, M. Machida and K. Kadowaki, "THz Wave Emission from the Intrinsic Josephson Junctions of High- T_c Superconductors", presented as a poster presentation at the "International Conference on Low Temperature Physics (LT 25)", Amsterdam, The Netherlands, 6-13 August, 2008.
 10. K. Yamaki, M. Tsujimoto, H. Yamaguchi, T. Yamamoto, H. Minami and K. Kadowaki, "Angular Distribution of THz Emission from Rectangular Mesa of Single Crystalline $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ ", presented as a poster presentation at the ESF-JSPS NES program, "International Workshop on Nanostructured Superconductors: From Fundamentals To Applications", Freudenstadt-Lauterbad, Germany, September 13th-17th 2008.
 11. T. Saitou, S. Sato, T. Yamamoto and K. Kadowaki, "Anomalous Josephson Vortex States in $\text{Bi}2212$ Intrinsic Josephson Junctions under High Magnetic Fields", presented as a poster presentation at the "3rd International Autumn Seminar on Nanoscience and Engineering in Superconductivity for Young Scientists", held in November 24th - 30th, 2008, Tokyo New Hankyu Hotel Tsukiji, 32nd floor.
 12. S. Sato, T. Saito and K. Kadowaki, "Superconducting Properties of Iodine Intercalated $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ ($I\text{-Bi}2212$)", presented as a poster presentation at the "3rd International Autumn Seminar on Nanoscience and Engineering in Superconductivity for Young Scientists", held in November 24th - 30th, 2008, Tokyo New Hankyu Hotel Tsukiji, 32nd floor.
 13. M. Tsujimoto, T. Yamamoto, H. Minami and K. Kadowaki, "THz Radiation from $\text{Bi}2212$ Mesa Structure Fabricated by Focused Iron Beam Milling", presented as a poster presentation at the "3rd International Autumn Seminar on Nanoscience and Engineering in Superconductivity for Young Scientists", held in November 24th - 30th, 2008, Tokyo New Hankyu Hotel Tsukiji, 32nd floor.
 14. M. Namai and K. Kadowaki, "Synthesis and Formation of Phases in Alkaline Earth Metal Graphite Intercalation Compounds", presented as a poster presentation at the "3rd International Autumn Seminar on

- Nanoscience and Engineering in Superconductivity for Young Scientists*", held in November 24th - 30th, 2008, Tokyo New Hankyu Hotel Tsukiji, 32nd floor.
15. S. Hashimoto and K. Kadowaki, "*Fabrication and Physical Properties of High- T_c Superconducting Whiskers*", presented as a poster presentation at the "*3rd International Autumn Seminar on Nanoscience and Engineering in Superconductivity for Young Scientists*", held in November 24th - 30th, 2008, Tokyo New Hankyu Hotel Tsukiji, 32nd floor.
 16. T. Mochiji, Shen V. Chong, T. Mochiku and K. Kadowaki, "*Synthesis and Characterization $CeFeAsO_{1-x}F_x$* ", presented as a poster presentation at the "*3rd International Autumn Seminar on Nanoscience and Engineering in Superconductivity for Young Scientists*", held in November 24th - 30th, 2008, Tokyo New Hankyu Hotel Tsukiji, 32nd floor.
 17. H. Yamaguchi, I. Kakeya, H. Minami, T. Yamamoto, M. Tsujimoto, K. Yamaki and K. Kadowaki, "*THz Electromagnetic Waves from Higher-Temperature Superconductor $Bi_2Sr_2CaCu_2O_{8+\delta}$ Intrinsic Josephson Junctions*", presented as a poster presentation at the "*3rd International Autumn Seminar on Nanoscience and Engineering in Superconductivity for Young Scientists*", held in November 24th - 30th, 2008, Tokyo New Hankyu Hotel Tsukiji, 32nd floor.
 18. Shen V. Chong, "*Superconductivity and Magnetic Ordering Induced by Yttrium-doping in AFe_2As_2 ($A=Sr, Ca$)*", presented as a poster presentation at "*MANA International Symposium 2009 Jointly with ICYS*", Feb. 25th-27th, 2009, Tsukuba International Congress Center (EPOCAL), Tsukuba, Ibaraki, Japan.
 19. Kazuhiro Yamaki, "*Several Microwatt Level of Emission from Rectangular Shape $Bi2212$ Mesa - Improvement in Radiation Power and Towards the Realization of THz Generator*", presented as a poster presentation at "*MANA International Symposium 2009 Jointly with ICYS*", Feb. 25th-27th, 2009, Tsukuba International Congress Center (EPOCAL), Tsukuba, Ibaraki, Japan.
 20. Manabu Tsujimoto, "*Terahertz Radiation from Cylindrical Structure of Intrinsic Josephson Junction System of $Bi_2Sr_2CaCu_2O_{8+\delta}$* ", presented as a poster presentation at "*MANA International Symposium 2009 Jointly with ICYS*", Feb. 25th-27th, 2009, Tsukuba International Congress Center (EPOCAL), Tsukuba, Ibaraki, Japan.
 21. K. Yamaki, M. Tsujimoto, H. Yamaguchi, T. Yamamoto, H. Minami and K. Kadowaki, "*Strong Emission from Rectangular Mesas of Intrinsic Josephson Junctions (IJJ's)*", presented as a poster presentation at "*the 2nd International Symposium on Interdisciplinary Materials Science, ISIMS-2009*", March 9-10, Tsukuba International Congress Center (EPOCAL), Tsukuba, Ibaraki, Japan.
 22. Mizuho Namai and K. Kadowaki, "*Synthesis and Superconducting Properties of Superconducting Graphite Intercalated Compounds*", presented as a poster presentation at "*the 2nd International Symposium on Interdisciplinary Materials Science, ISIMS-2009*", March 9-10, Tsukuba International Congress Center (EPOCAL), Tsukuba, Ibaraki, Japan.
 23. S. Sato and K. Kadowaki, "*Properties of Intrinsic Josephson Junction of Iodine Intercalated $Bi_2Sr_2CaCu_2O_{8+\delta}$ ($I-Bi2212$) Single Crystal*", presented as a poster presentation at "*the 2nd International*

Symposium on Interdisciplinary Materials Science, ISIMS-2009", March 9-10, Tsukuba International Congress Center (EPOCAL), Tsukuba, Ibaraki, Japan.

24. S. Hashikoto and K. Kadowaki, "*Fabrication and Physical Properties of Rare-Earth 123 based Whiskers*", presented as a poster presentation at "*the 2nd International Symposium on Interdisciplinary Materials Science, ISIMS-2009*", March 9-10, Tsukuba International Congress Center (EPOCAL), Tsukuba, Ibaraki, Japan.
25. K. Kadowaki, M. Tsujimoto, K. Yamaki, H. Yamaguchi, H. Minami, R. Klemm, U. Welp, K. Gray and W. -K. Kwok, "*THz LASER Emission from Various Types of Messas*", presented as a poster presentation at the "*International Workshop on Optical Terahertz Science and Technology 2009, OTST-09*", March 7-11, 2009, Santa Barbara, CA, USA.

[学会招待講演]

1. 「 $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ メサ構造からのテラヘルツ波発振」、門脇和男、橋本真也、門脇和男、日本物理学会第 64 回年次大会（立教大学、立教池袋中学・高校）、平成 21 年（2009 年）3 月 28 日、領域 8、領域 6 合同シンポジウム(28pTC)にて招待講演、日本物理学会講演概要集第 64 巻第 1 号第 3 分冊、p616。
2. "*Josephson LASER Working at THz Frequencies in Intrinsic Josephson Junctions*", K. Kadowaki, *APS(American Physical Society) March Meeting*, March 16-20, 2009, given by oral presentation, Session X2-4, Symposium on Vortex Dynamics and Josephson LASERS in Superconductors, chaired by Alexander Gurevich, Program & Show Guide, p520.

[国内会議の一般口頭発表]

1. K. Kadowaki, "*Present Experimental Status of THz LASER*", presented at the Informal Meeting on THz Radiation in Intrinsic Josephson Junctions, held at Advanced Research Laboratory B, Univ. of Tsukuba, June 24, 2008.
2. 門脇和男、ATI 第一回スピントロニクス研究会にて「高温超伝導体の固有ジョセフソン素子を用いた THz レーザー」と題して講演を行う。平成 20 年 11 月 1 日、長野県ホテルメトロポリタン長野にて。

[外国での一般講演]

[国内での一般講演]

1. 門脇和男、「高く、もっと高く、常温超伝導体の探求」、応用理工学一日体験教室、2008 年 7 月 28 日、筑波大学
2. 門脇和男、「科学者の夢、常温超伝導」、日本物理学会主催市民講演会、盛岡市民文化ホール（マリオス）小ホール、平成 20 年 9 月 21 日(13 : 00~16:30)

3. 門脇和男、「高く、もっと高く、常温超伝導の探求」、SSH(Super Science High School)研究発表会記念講演会、平成 20 年 10 月 21 日、岩手県立水沢高等学校にて
4. “THz Wave Generation from High-Tc Superconductor $\text{Bi}_2\text{Sr}_2\text{aCu}_2\text{O}_{8+\delta}$ Intrinsic Josephson Junctions”, K. Kadowaki, K. Yamaki, M. Tsujimoto, T. Yamamoto, H. Yamaguchi, H. Minami, T. Hattori, M. Tachiki, H. Matsumoto, T. Koyama, M. Machida, S. Lin, X. Hu, L. Ozyuzer, A. E. Koshelev, C. Kurter, K. E. Gray, W. -K. Kwok and U. Welp, presented at the “NIMS MANA Seminar”, NIMS, December 19th, 2008.
5. 門脇和男、「科学技術と教育」、平成 21 年 2 月 3 日、水戸第二高等学校にて出前講義。

[学会発表]

1. 「 $\text{CeO}_{1-x}\text{F}_x\text{FeAs}$ の作成と特性評価」、持地貴紘、Shem V. Chong、門脇和男、日本物理学会 2008 年秋季大会（岩手大学上田キャンパス）、平成 20 年（2008 年）9 月 20 日、領域 8(20aYA-11)にて口頭発表、日本物理学会講演概要集第 63 巻第 2 号第 3 分冊、p447。
2. “Varying the T_c in superconducting Gadolinium Oxy-Pnictide systems, Shen V. Chong, T. Mochiji and K. kadowaki, 日本物理学会 2008 年秋季大会（岩手大学上田キャンパス）、平成 20 年（2008 年）9 月 20 日、領域 8(20aYA-12)にて口頭発表、日本物理学会講演概要集第 63 巻第 2 号第 3 分冊、p447。
3. 「矩形型 $\text{Bi}2212$ 単結晶メサを用いたテラヘルツ波発振の角度依存性」、八巻和宏、辻本学、山口勇人、山本卓、南英俊、掛谷一弘、門脇和男、日本物理学会 2008 年秋季大会（岩手大学上田キャンパス）、平成 20 年（2008 年）9 月 20 日、領域 8(23aQE-3)にて口頭発表、日本物理学会講演概要集第 63 巻第 2 号第 3 分冊、p570。
4. 「グラファイト層間化合物 CaC_6 の置換効果」、生井瑞穂、門脇和男、日本物理学会 2008 年秋季大会（岩手大学上田キャンパス）、平成 20 年（2008 年）9 月 21 日、領域 7(21aWF-3)にて口頭発表、日本物理学会講演概要集第 63 巻第 2 号第 4 分冊、p746。
5. 「高温超伝導体 $\text{Bi}2212$ による THz 波発振とその高調波」、山口勇人、掛谷一弘、南英俊、辻本学、八巻和宏、山本卓、門脇和男、日本物理学会 2008 年秋季大会（岩手大学上田キャンパス）、平成 20 年（2008 年）9 月 23 日、領域 8(23aQE-4)にて口頭発表、日本物理学会講演概要集第 63 巻第 2 号第 3 分冊、p570。
6. 「 $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ 単結晶メサによるテラヘルツ波発振の形状効果」、辻本学、八巻和宏、山口勇人、山本卓、南英俊、掛谷一弘、門脇和男、日本物理学会 2008 年秋季大会（岩手大学上田キャンパス）、平成 20 年（2008 年）9 月 23 日、領域 8(23aQE-5)にて口頭発表、日本物理学会講演概要集第 63 巻第 2 号第 3 分冊、p571。
7. 「多層固有ジョセフソン接合系における THz 電磁波の放射強度と放射率について」、門脇和男、Richard Klemm、八巻和宏、辻本学、南英俊、日本物理学会 2008 年秋季大会（岩手大学上田キャンパス）、平成 20 年（2008 年）9 月 23 日、領域 8(23aQE-6)にて口頭発表、日本物理学会講演概要集第 63 巻第 2 号第 3 分冊、p571。
8. 「十分長い $\text{Bi}2212$ 固有ジョセフソン接合に於ける高磁場でのジョセフソン磁束状態(III)」、齊

- 藤隆志、山本卓、門脇和男、日本物理学会 2008 年秋季大会（岩手大学上田キャンパス）、平成 20 年（2008 年）9 月 23 日、領域 8(23aQE-7)にて口頭発表、日本物理学会講演概要集第 63 巻第 2 号第 3 分冊、p571。
9. 「Bi2212 微小固有ジョセフソン接合の作成と接合特性評価」、山本卓、門脇和男、掛谷一弘、日本物理学会 2008 年秋季大会（岩手大学上田キャンパス）、平成 20 年（2008 年）9 月 23 日、領域 8(23aQE-8)にて口頭発表、日本物理学会講演概要集第 63 巻第 2 号第 3 分冊、p571。
 10. 「Bi 系ウイスカーの作製と物性測定 II」、橋本慎也、門脇和男、日本物理学会 2008 年秋季大会（岩手大学上田キャンパス）、平成 20 年（2008 年）9 月 23 日、領域 8(23pQE-10)にて口頭発表、日本物理学会講演概要集第 63 巻第 2 号第 3 分冊、p580。
 11. 「ヨウ素インターカレーとした $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ 単結晶の超伝導特性評価(II)」、佐藤峻、齊藤隆志、門脇和男、日本物理学会 2008 年秋季大会（岩手大学上田キャンパス）、平成 20 年（2008 年）9 月 23 日、領域 8(23pQE-11)にて口頭発表、日本物理学会講演概要集第 63 巻第 2 号第 3 分冊、p580。
 12. 「 $\text{CeFeAsO}_{1-x}\text{F}_x$ の合成と特性評価 II」、持地貴紘、Shen V. Chong, 茂筑高士、門脇和男、日本物理学会第 64 回年次大会（立教大学、立教池袋中学・高校）、平成 21 年（2009 年）3 月 27 日、領域 8(27pTC-5)にて口頭発表、日本物理学会講演概要集第 64 巻第 1 号第 3 分冊、p556。
 13. "*Exploring the Single Crystal Growth of Iron-Arsenide Compounds via the Bridgeman Method*", S. V. Chong, and K. Kadowaki, 日本物理学会第 64 回年次大会（立教大学、立教池袋中学・高校）、平成 21 年（2009 年）3 月 28 日、領域 8(28aPS-25)にてポスター発表、日本物理学会講演概要集第 64 巻第 1 号第 3 分冊、p601。
 14. 「Bi2201 相における Ca ドーピング効果の研究」、吉崎亮造、池田 博、門脇和男、日本物理学会第 64 回年次大会（立教大学、立教池袋中学・高校）、平成 21 年（2009 年）3 月 30 日、領域 8(30aVL-6)にて口頭発表、日本物理学会講演概要集第 64 巻第 1 号第 3 分冊、p657。
 15. 「Bi2212 固有ジョセフソン接合系のテラヘルツ発振特性」、南 英俊、折田尚樹、小池 隆、門脇和男、日本物理学会第 64 回年次大会（立教大学、立教池袋中学・高校）、平成 21 年（2009 年）3 月 30 日、領域 8(30pTA-1)にて口頭発表、日本物理学会講演概要集第 64 巻第 1 号第 3 分冊、p659。
 16. 「メサ型に加工した Bi2212 固有接合系による電磁波発振現象と発機構の解明」、八巻和宏、辻本 学、山口勇人、山本 卓、南 英俊、門脇和男、日本物理学会第 64 回年次大会（立教大学、立教池袋中学・高校）、平成 21 年（2009 年）3 月 30 日、領域 8(30pTA-3)にて口頭発表、日本物理学会講演概要集第 64 巻第 1 号第 3 分冊、p659。
 17. 「 $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ 単結晶メサによるテラヘルツ波発振の形状効果 II」、辻本 学、八巻和宏、山口勇人、山本 卓、南 英俊、南 英俊、門脇和男、日本物理学会第 64 回年次大会（立教大学、立教池袋中学・高校）、平成 21 年（2009 年）3 月 30 日、領域 8(30pTA-4)にて口頭発表、日本物理学会講演概要集第 64 巻第 1 号第 3 分冊、p659。
 18. 「銅酸化物高温超伝導体 Bi2212 単結晶における微小固有ジョセフソン接合の作製と電流電圧

特性」、山本卓、門脇和男、日本物理学会第 64 回年次大会（立教大学、立教池袋中学・高校）、平成 21 年（2009 年）3 月 30 日、領域 8(30pTA-5)にて口頭発表、日本物理学会講演概要集第 64 巻第 1 号第 3 分冊、p659。

19. 「Rare-Earth 123 系ウイスキーの作製と物性測定」、橋本真也、門脇和男、日本物理学会第 64 回年次大会（立教大学、立教池袋中学・高校）、平成 21 年（2009 年）3 月 30 日、領域 8(30pTA-8)にて口頭発表、日本物理学会講演概要集第 64 巻第 1 号第 3 分冊、p660。
20. "*Superconductivity in Sr-122 Iron Arsenide System by Yttrium Doping*", Shen V. Chong and K. Kadowaki, *APS(American Physical Society) March Meeting*, March 16-20, 2009, given by oral presentation, Session A35-12, Program & Show Guide, p93.
21. "*Temperature and Field Dependence of the Emission of Terahertz Waves from Intrinsic Josephson Junctions*", Ulrich Welp, Alexei Koshelev, Lutfy Ozyuzer, Cihan Kurter, Masashi Tachiki, Kazuo Kadowaki, Takashi Yamamoto and Wai -K. Kwok, *APS(American Physical Society) March Meeting*, March 16-20, 2009, given by oral presentation, Session D34-1, Program & Show Guide, p183.
22. "*Angular Dependence of the Radiation Power of a Josephson STAR-emitter*", Richard Klemm and K. Kadowaki, *APS(American Physical Society) March Meeting*, March 16-20, 2009, given by oral presentation, Session D34-3, Program & Show Guide, p183.
23. "*Direct Observation of THz Radiation from Cylindrical Structure of Intrinsic Josephson Junction System of Bi2212*", M. Tsujimoto, T. Yamamoto, H. Minami, K. Kadowaki, M. Tachiki, U. Welp and W. -K. Kwok, *APS(American Physical Society) March Meeting*, March 16-20, 2009, given by oral presentation, Session A35-12, Program & Show Guide, p183.

[国際（国内）会議、研究会、セミナーなどの座長、議長、司会、Advisory board、その他]

1. Chairman of the Session of "*Terahertz Emission JJ-I*", at the "*International Conference on Theoretical Physics, DUBNA-NANO 2008*", July 7-11, 2008, Dubna, Russia.
2. Chairman of the Session "*E: Terahertz Emission –III*" at the "*6th International Symposium on Intrinsic Josephson Effect in High-Tc Superconductors*", July 17-19, 2008, POSTECH, Pohang, Korea.
3. Chairman of the session of "*Quantum Gasses*" at the "*32nd International Workshop on Condensed Matter Theories, in commemoration of the birth centenary of Lev Davidovich Landau 1908-1968*", held at Loughborough University, United Kingdom, 13-18 August 2008.
4. Chairman of the session "*3 Intrinsic JJs/THz Radiation*", at the ESF-JSPS NES program, "*International Workshop on Nanostructured Superconductors: From Fundamentals To Applications*", Freudenstadt-Lauterbad, Germany, September 13th-17th 2008.
5. Chairman of the "*CTC-NES International Mini Workshop on THz Radiation from Intrinsic Josephson Junctions - The First One Year Anniversary of the Discovery*", November 23rd, 2008, TKP Ginza Business Center 8th Floor B.
6. Chairman of the "*3rd International Autumn Seminar on Nanoscience and Engineering in*

Superconductivity for Young Scientists", November 24th - 30th, 2008, Tokyo New Hankyu Hotel Tsukiji, 32nd floor.

7. Chairman of the "*Joint JSPS-ESF International Conference on Nanoscience and Engineering in Superconductivity*", Okura Frontier Hotel Tsukuba, March 23rd - 26th, 2009.
8. Member of the International Advisory Committee of the "*International Conference on Theoretical Physics, Dubna-NANO 2008*", held at the Bogoliubov Laboratory of Theoretical Physics, Dubna, Russia, 7-11 July, 2008.
9. Member of the International Advisory Committee of the "*6th International Symposium on Intrinsic Josephson Effect and Plasma Oscillations I High- T_c Superconductors (PLASMA 2008)*", POSTEC, Pohang, Korea, 17-19 July, 2008.
10. Member of the Advisory Board of the "*International Conference on Low Temperature Physics (LT-25)*", Amsterdam, The Netherlands, 6-13 August, 2008.

[国際（国内）会議、国際（国内）ワークショップ等の主催]

1. Served as Coorganizers of the "*6th International Symposium on Intrinsic Josephson Effect in High- T_c Superconductors*", July 17-19, 2008, POSTECH, Pohang, Korea.
2. Served as the organizer of the "*CTC-NES International Mini Workshop on THz Radiation from Intrinsic Josephson Junctions – The First one Year Anniversary of the Discovery-*", TKP Ginza Business Center 8th floor B, November 23rd 2008.
3. Served as the one of organizers of the ESF-JSPS (NES) program, "*International Workshop on Nanostructured Superconductors: From Fundamentals To Applications*", Freudenstadt-Lauterbad, Germany, September 13th-17th 2008.
4. Served as the organizer of the "*3rd International Autumn Seminar on Nanoscience and Engineering in Superconductivity for Young Scientists*", held at Tokyo New Hankyu Hotel Tsukiji, 32nd floor, November 24-30, 2008.
5. Served as the organizer of the "*Joint JSPS-ESF International Conference on Nanoscience and Engineering in Superconductivity*", Okura Frontier Hotel Tsukuba, March 23rd - 26th, 2009.

[特許、意匠などの知的所有権]

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[その他特記事項]