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【研究概要】

固体物質の物理的性質を研究している。純良な大型単結晶を自作し、それらの極低温の状態における物質の電気的、磁氣的、熱的な性質を調べることにより、磁性と超伝導を結ぶ量子臨界現象、希土類磁性化合物の物性などを明らかにしている。また、エックス線やシンクロトロン放射光を用いた実験により、結晶の構造や物性、液体やアモルファスなどの構造不規則系の構造や物性を調べている。

【研究業績:論文】

2008

- Transport Properties of Manganese Perovskites $\text{Bi}_{1-x}\text{Ca}_x\text{MnO}_3$ ($0.7 \leq x \leq 0.95$).
Mizushima, T., Shimizu, K., Kuwai, T., Atou, T., and Isikawa, Y.
J. Physics: Conference Series, **150**, 04130–04133 (2009).
- The heat capacity of PrPd_3 in magnetic fields.
Zhang, S., Kuwai, T., Mizushima, T., and Isikawa, Y.
J. Physics: Conference Series, **150**, 042074–042077 (2009).
- Magneto-transport study on quasi 1-D magnet of $\text{Ca}_3(\text{Co}_{1-x}\text{M}_x)_2\text{O}_6$ (M: Ni, Fe, V, Ti; $x \leq 0.1$).
Luo, J., Aida, M., Yamada, K., Honda, Z., Sakakibara, T., Tayama, T., and Ohsugi, I.J.
Journal of Optoelectronics and Advanced Materials, **10**, 1032–1037 (2008).
- Magnetic and Specific Heat Properties of $\text{Nd}_x\text{Fe}_4\text{Sb}_{12}$.
Ikeno, T., Tanaka, K., Kikuchi, D., Kuwahara, K., Aoki, Y., Sato, H., and Isikawa, Y.
J. Phys. Soc. Jpn., **77**, Suppl. A, 309–311 (2008).

- Superconductivity and quantum criticality in the heavy-fermion system $\beta\text{-YbAlB}_4$.
Nakatsuji, S., Kuga, K., Machida, Y., Tayama, T., Sakakibara, T., Karaki, Y., Ishimoto, H., Yonezawa, S., Maeno, Y., Pearson, E., Lonzarich, G. G., Balicas, L., Lee, H., and Fisk, Z.
Nature Physics, **4**, 603–607 (2008).
- Ordering mechanism and spin fluctuations in a geometrically frustrated heavy-fermion antiferromagnet on the Kagome-like lattice CePdAl : A ^{27}Al NMR study.
Oyamada, A., Maegawa, S., Nishiyama, M., Kitazawa H., and Isikawa, Y.
Phys. Rev. B, **77**, 064432–1–9 (2008).
- Probing the nodal structures of heavy electron superconductors by means of specific heat measurements in magnetic fields.
Sakakibara, T., Custers, J., Yano, K., Yamada, A., Tayama, T., Aoki, Y., Sato, H., Sugawara, H., Amitsuka, H., and Yokoyama, M.
Physica B, **403**, 990–993 (2008).
- Multipole phenomena and superconductivity in Pr-based filled skutterudites.
Sakakibara, T., Yano, K., Sato, H., Tayama, T., Custers, J., Sugawara, H., Aoki, Y., and Sato H.J. *Phys. Soc. Jpn.*, **77**, Suppl. A 180–186 (2008).
- Magnetic Phase diagram of $\text{Pr}_{1-x}\text{La}_x\text{Fe}_4\text{P}_{12}$ ($0 \leq x \leq 0.15$).
Tayama, T., Isobe, Y., Sakakibara, T., Sugawara, H., Aoki, H., and Sato H.
J. Phys. Soc. Jpn., **77**, Suppl. A 78–83 (2008).
- The EXAFS Debye-Waller Factors of the Tellurium Nanoparticles.
Ikemoto, H., Goyo, A., Yoshida, S., Miyanaga T., and Nitta, K.
e-Journal of Surface Science and Nanotechnology, **7**, 45–47 (2009).
- Transport properties accompanied by collapse of antiferromagnetism of $\text{Eu}(\text{Pt}_{1-x}\text{Ni}_x)_2\text{Si}_2$.
Mitsuda, A., Ikeda, Y., Ietaka, N., Fukuda, S., and Isikawa, Y.
Physica B, **403**, 786–788 (2008).
- X-ray fluorescence holography of $\text{In}_{1-x}\text{Ga}_x\text{Sb}$ mixed crystal.
Hosokawa, S., Ozaki, T., Takata, N., Happo, N., Ikemoto, H., Shishidod, T., and Hayashi, K.
Journal of Crystal Growth, **311**, 978–981 (2009).
- Field-angle-dependent specific heat measurements and gap determination of a heavy fermion superconductor URu_2Si_2 .
Yano, K., Sakakibara, T., Tayama, T., Yokoyama, M., Amitsuka, H., Homma, Y., Miranovic, P., Ichioka, M., Tsutsumi, Y., and Machida, K.

Phys. Rev. Lett., **100**, 017004 (2008).

- Heavy-electron-like behavior in cubic PrCu₄Au.
Zhang, S., Mizushima, T., Kuwai, T., and Isikawa, Y.
J. Phys.: Condens. Matter., **21**, 205601 (2009).

2007

- Origin of Weak Ferromagnetism in Yb_xFe₄Sb₁₂, Relationship between Weak Ferromagnetism and Filling Ratio x.
Ikeno, T., Mitsuda, A., Mizushima, T., Kuwai, T., and Isikawa, Y., Tamura, I.
J. Phys. Soc. Jpn., **75**, 024708-1-024708-6 (2007).
- Transport properties under high pressure of antiferromagnet EuPt₂Si₂ with unstable Eu valence.
Ikeda, Y., Mitsuda, A., Ietaka, N., Mizushima, T., Isikawa, Y., and Kuwai, T.
J. Magn. Magn. Mater., **310**, e62-64 (2007).
- Effect of filling ratio x of Yb_xFe₄Sb₁₂ single crystals on weak-ferromagnetic transition.
Ikeno, T., Mitsuda, A., Kuwai, T., Mizushima, T., Isikawa, Y., and Tamura, I.
J. Magn. Magn. Mater., **310**, e298-300 (2007).
- Possibility of Kondo effect in diluted EuPd₂Si₂ systems with constant lattice volume.
Kuwai, T., Suzuki, H., Saitoh, T., Nambu, T., Mitsuda, A., Mizushima, T., and Isikawa, Y.
J. Magn. Magn. Mater., **310**, e68-70 (2007).
- Collapse of antiferromagnetism induced by Ni-substitution in Eu(Pt_{1-x}Ni_x)₂Si₂.
Mitsuda, A., Ikeda, Y., Ietaka, N., Fukuda, S., and Isikawa, Y.
J. Magn. Magn. Mater., **310**, 319-321 (2007).
- Electrical resistivity of heavy-fermion system of cubic YbCu₅ under high pressures. A.
Mitsuda, K. Yamauchi, N. Tsujii, K. Yoshimura, Y. Isikawa, Y. Yamada J.
Phys. Soc. Jpn., **76**, Suppl. A 78-79 (2007).
- Extended X-Ray-Absorption Fine Structure Study of Local Structure and Atomic Correlations of Tellurium Nanoparticles.
Ikemoto, H., and Miyanaga, T.
Phys. Rev. Lett., **99**, 165503 (2007).
- X-ray Diffraction Study of Bismuth nanoparticles.
Ikemoto, H., Yoshida, S., and Goyou, A.
e-J. of Surf. Sci. and Nanotechnology, **5**, 3394 (2007).

- Phase transitions of bismuth clusters.
Ikemoto, H., Miyanaga, T., and Kiuchi, T.
J. Non-Cryst. Solids, **353**, 3394 (2007).
- Local structure of liquid Rb-Se mixtures near the miscibility gap.
Maruyama, K., Hoshino, H., Ikemoto, H., Miyanaga, T., and Endo, H.
J. Non-Cryst. Solids, **353**, 3017 (2007).
- Features of dislocation images reconstructed from step-scanned white X-ray section topographs.
Kajiwara, K., Kawado, S., Iida, S., Suzuki, Y. and Chikaura, Y.
phys. stat. sol. (a), **204**, 2682–2687 (2007).
- Magnetic order of CePdAl under pressure – neutron diffraction study.
Prokes, K., Manuel, P., Adroja, D.T., Kitazawa, H., Goto, T., and Isikawa, Y.
J. Magn. Magn. Mater., **310**, e28–30 (2007).
- Nuclear magnetic Resonance Study of Magnetic Properties of ErMn_6Sn_6 .
Shimizu, K., Hori, T.
J. Magn. Magn. Mater., **310**, 1874 –1876 (2007).
- Origin of weak ferromagnetism in $\text{Yb}_x\text{Fe}_4\text{Sb}_{12}$, relationship between weak ferromagnetism and filling ratio x ,
Ikeno, T., Mitsuda, A., Mizushima, T., Kuwai, T., Isikawa, Y., and Tamura I.
J. Phys. Soc. Jpn., **76**, (No.2) 024708–1–7 (2007).
- Praseodymium-deficiency effects upon physical properties of bulk $\text{Pr}_{0.6}\text{Sr}_{0.4}\text{MnO}_3$ manganite.
Cheikhrouhou-Koubaa, W., Koubaa, M., Cheikhrouhou, A., and Shimizu, K.
J. Magn. Magn. Mater., **310**, 237– 239 (2007).
- Relationship between Quadrupole Splitting and Filling Ratio x in $\text{Yb}_x\text{Fe}_4\text{Sb}_{12}$.
Tamura, I., Ikeno, T., Mizushima, T., and Isikawa, Y.
J. Phys. Soc. Jpn., **76**, (No.6) 065004–1–2 (2007).
- Characterization of strained Si wafers by X-ray diffraction techniques.
Shimura, T., Kawamura, K., Asakawa, M., Watanabe, H., Yasutake, K., Ogura, A., Fukuda, K., Sakata, O., Kimura, S., Edo, H., Iida, S. and Umeno, M.
J Mater Sci.: Mater Electron.
- Universal Scaling in the Dynamical Conductivity of Heavy Fermion Ce and Yb Compounds.

Okamura, H., Watanabe, T., Matsunami, M., Nishihara, T., Tsujii, N., Ebihara, T., Sugawara, H., Sato, H., Onuki, Y., Isikawa, Y., Takabatake, T., and Nanba, T.
J. Phys. Soc. Jpn., **76**, (No.2) 023703–1–5 (2007).

2006

- One-dimensional antiferromagnetism in the piezoelectric layered compound BaMnF_4 .
Yosimura, M., Hidaka, M., Mizushima, T., Sakurai, J., Tsuboi, T., and Kleemann, W.
J. Magn. Magn. Mater., **299**, 404–411(2006).
- .Dramatic evolution of magnetic properties induced by electronic change in $\text{Ce}(\text{Pd}_{1-x}\text{Ag}_x)_2\text{Al}_3$.
Sun, P., Lu, Q., Ikeno, T., Kuwai, T., Mizushima, T., and Isikawa, Y.
J. Phys.: Condens. Matter., **18**, 5715–5726 (2006).
- Thermoelectric power of heavy-Fermion system $\text{YbCu}_{5-x}\text{Ag}_x$.
Mitsuda, A., Yamauchi, K., Tsujii, N., Yoshimura, K., Mizushima, T., and Isikawa, Y.
Physica B, **378–380**, 742–743 (2006).
- Non-magnetic-doublet ground state in PrInCu_2 : Enhancement of the specific heat coefficient at low temperatures.
Ikeno, T., Isikawa, Y., Kuwai, T., Mitsuda, A., and Mizushima, T.
Physica B, **378–380**, 677–678 (2006).
- Thermoelectric properties of $\text{Ce}(\text{Ni,Pd})_2\text{Ge}_2$ at low temperatures below 1 K.
Kuwai, T., Sun, P., Sugihara, T., Suzuki, H., Takeuchi, M., Mizushima, T., Mitsuda, A., Isikawa, Y., and Fukuhara, T.
Physica B, **378–380**, 146–147 (2006).
- ^{55}Mn NMR study of the electron-doped manganite $\text{Bi}_{0.125}\text{Ca}_{0.875}\text{MnO}_3$.
Shimizu, K., Qin, Y., and Tyson, T.A.
Physical Review, B, **73**, 174420–1–5 (2006).
- De Hass-van Alphen effect in antiferromagnetic SmCu_2 .
Maezawa, K., Horita, H., Fukuhara, T., Isikawa, Y., and Sato, K.
Physica B, **378–380**, 1083–1084 (2006).
- White x-ray topography of lattice undulation in bonded silicon on-insulator wafers.
Fukuda, K., Yoshida, T., Shimura, T., Yasutake, K., Umeno, M., and Iida, S.
Jpn. J. Appl. Phys., **45**, 6795–6799 (2006).
- Electron Energy Loss Spectroscopy Analysis of the Nitride Precipitate's Structure in Nitrogen.

Fujimori, H. , and Ikemoto, H.

Proceedings of the Sixteenth International Microscopy Congress, 1462 (2006).

- EXAFS Study of Semimetal–Semiconductor Transition of Bismuth Clusters.
Ikemoto, H., Miyanaga, T., Yoshida, S., and Sogoh, J.
AIP Conf. Proc., **882**, 437 (2007).
- Transport properties under high pressure of antiferromagnet EuPt_2Si_2 with unstable Eu valence.
Ikeda, Y., Mitsuda, A., Ietaka, N., Mizushima, T., Isikawa, Y., and Kuwai, T.
J. Magn. Magn. Mater. **310**, e62-64 (2007).
- Effect of filling ratio x of $\text{Yb}_x\text{Fe}_4\text{Sb}_{12}$ single crystals on weak-ferromagnetic transition.
Ikeno, T., Mitsuda, A., Kuwai, T., Mizushima, T., Isikawa, Y., and Tamura, I.
J. Magn. Magn. Mater. **310**, e298-300 (2007).
- Origin of weak ferromagnetism in $\text{Yb}_x\text{Fe}_4\text{Sb}_{12}$, relationship between weak ferromagnetism and filling ratio x .
Ikeno, T., Mitsuda, A., Mizushima, T., Kuwai, T., Isikawa, Y., and Tamura, I.
J. Phys. Soc. Jpn. **76**, 024708-1-7 (2007).
- Non-magnetic-doublet ground state in PrInCu_2 : Enhancement of the specific heat coefficient at low temperatures.
Ikeno, T., Isikawa, Y., Kuwai, T., Mitsuda, A., and Mizushima, T.
Physica B, **378-380**, 677-678 (2006).
- Non-enhancement of thermoelectric-power coefficient of PrInAg_2 at low temperatures.
Isikawa, Y., Ikeno, T., Sugihara, T., Kinoshita, T., Kuwai, T., and Mizushima, T.
J. Magn. Magn. Mater., **310**, 289-291 (2007).
- Dislocation Elimination in Czochralski Silicon Crystal Growth Revealed by X-ray Topography Combined with Topo–Tomographic Technique Proceedings of SRI2006.
Kawado, S., Iida, S., Kajiwara, K., Suzuki, Y. and Chikaura, Y.
AIP Conference Proceedings vol., **879**, 1545–1549 (2007).
- Thermoelectric properties of $\text{Ce}(\text{Ni},\text{Pd})_2\text{Ge}_2$ at low temperatures below 1 K.
Kuwai, T., Sun, P., Sugihara, T., Suzuki, H., Takeuchi, M., Mizushima, T., Mitsuda, A., Isikawa, Y., and Fukuhara, T.
Physica B, **378-380**, 146-147 (2006).
- Magnetic order in CePdAl single crystal: effect of magnetic field.
Prokes, K., Manuel, P., Adroja, D. T., Kitazawa, H., Goto, T., and Isikawa, Y.

Physica B, **385–386**, 359–362 (2006).

- Magnetic structure of TbNiAl₄ W.D. Hutchison, Goossens, D.J., Nishimura, K., Mori, K., Isikawa, Y., and Studer, A.J. J. Magn. Magn. Mater., **301**, 352–358 (2006).
- Mossbauer Effect and Magnetization Studies of YbFe₄Sb₁₂ and LaFe₄Sb₁₂. Tamura, I., Ikeno, T., Mizushima, T., and Isikawa, Y. J. Phys. Soc. Jpn., **75**, 14707–1–6 (2006).
- Non-magnetic-doublet ground state in PrInCu₂: Enhancement of the specific heat coefficient at low temperatures. Ikeno, T., Isikawa, Y., Kuwai, T., Mitsuda, A., and Mizushima, T. Physica B, **378–380**, 677–678 (2006).
- Sb NQR Studies of Ferromagnetism in YbFe₄Sb₁₂ with $x \sim 0.89$. Kawaguchi, M, Tou, H., Sera, M., Kojima, K., Ikeno, T., and Isikawa, Y. J. Phys. Soc. Jpn., **75**, 93702–1–4 (2006).
- Thermoelectric power of heavy-Fermion system YbCu_{5-x}Ag_x. Mitsuda, A., Yamauchi, K., Tsujii, N., Yoshimura, K., Mizushima, T., and Isikawa, Y. Physica B, **378–380**, 742–743 (2006).
- Thermoelectric properties of Ce(Ni,Pd)₂Ge₂ at low temperatures below 1 K. Kuwai, T., Sun, P., Sugihara, T., Suzuki, H., Takeuchi, M., Mizushima, T., Mitsuda, A., Isikawa, Y., and Fukuhara, T. Physica B, **378–380**, 146–147 (2006).

2005

- Change of magnetic anisotropy in the antiferromagnetic-ferromagnetic transition in Ce(Pd_{1-x}M_x)₂Al₃ (M = Cu or Ag) Sun, P., Isikawa, Y., Kobayashi, K., Mizushima, T., and Kuwai, T. Physica B, **359–361**, 287–289 (2005).
- Correlation of initial slope of thermoelectric power and electronic specific-heat constant for solid solutions based on Ce and Eu compounds. Sakurai, J., and Isikawa, Y. J. Phys. Soc. Jpn., **74**, 1926–1929 (2005).
- Plane-wave synchrotron x-ray topography observation of grown-in microdefects in a slowly pulled CZ-silicon crystal. Iida, S., Kawado, S., Maehama, T., Kajiwara, K., Kimura, S., Matsui, J., Suzuki, Y., and Chikaura, Y.

J. Phys. D: Appl. Phys., **38**, A23–27 (2005).

- Optical Measurements of Silver Clusters in Zeolite 4A.
Ikemoto, H. and Kiuchi, T.
e-J. of Surf. Sci. and Nanotechnology, **3**, 270–271 (2005).
- EXAFS Study of the Local Structure for Semimetal–Semiconductor Transition in Bismuth Clusters.
Ikemoto, H., Deto, K. and Miyanaga, T.
e-J. of Surf. Sci. and Nanotechnology, **3**, 370–372 (2005).
- Three-dimensional structure of dislocations in silicon determined by synchrotron white x-ray topography combined with a topo-tomographic technique.
Kawado, S., Taishi, T., Iida, S., Suzuki, Y., Chikaura, Y. and Kajiwara, K.
J. Phys. D: Appl. Phys., **38**, A17–22, (2005).
- Experimental Observation of the 1/3 Magnetization Plateau in the Diamond-Chain Compound $\text{Cu}_3(\text{CO}_3)_2(\text{OH})_2$.
Kikuchi, H., Fujii, Y., Chiba, M., Mitsudo, S., Idehara, T., Tonegawa, T., Okamoto, K., Sakai, T., Kuwai, T., and Ohta, H.
Phys. Rev. Lett., **94**, 227201-1-4 (2005).
- Change of magnetic anisotropy in the antiferromagnetic-ferromagnetic transition in $\text{Ce}(\text{Pd}_{1-x}\text{M}_x)_2\text{Al}_3$ (M = Cu or Ag).
Sun, P., Isikawa, Y., Kobayashi, K., Mizushima, T., and Kuwai, T.
Physica B, **359-361**, 287-289 (2005).
- The magnetic properties of GdNiAl_4 .
Stewart, G. A., Hutchison, W. D., Edge, A. V. J., Rupprecht, K., Wortmann, G., Nishimura, K., and Isikawa, Y.
J. Magn. Magn. Mater., **292**, 72–78 (2005).
- Weak ferromagnetism stabilized by pressure and substitution of Y for Yb in YbInCu_4 .
Mitsuda, A., Nihonmatsu, H., Yamada, M., Ohta, H., Zhang, W., Yoshimura, K., Goto, T., Kolomyets, O., and Isikawa, Y.
Physica B, **359-361**, 229-231 (2005).

2004

- High field magnetization of TbNiAl_4 .
Mizushima, T., Isikawa, Y., Mitsuda, A., Kobayashi, K., Ishikawa, F., and Goto, T.
J. Magn. Magn. Mater., **272-276**, Suppl. E475–476 (2004).
- Magnetic properties of single crystals of RCoIn_5 (R = Tb, Dy, Ho, Er, Yb).
Isikawa, Y., Kato, D., Mitsuda, A., Mizushima, T., and Kuwai, T.
J. Magn. Magn. Mater., **272-276**, 635–636 (2004).

- ^{55}Mn NMR study in magnetically ordered state of perovskite manganites.
Shimizu, K., Boujelben, W., and Cheikh-Rouhou.
Physica status solidi., (a)**201**, 1421–1427 (2004).
- ^{55}Mn NMR study of $\text{La}_{1.2}\text{Sr}_{1.8-x}\text{Ca}_x\text{Mn}_2\text{O}_7$ ($x=0, 0.1, 0.2$).
Shimizu, K., Mizushima, T., Velázquez, M., Renard, J.-P., and Revcolevschi, A.
Journal of Magnetism and Magnetic Materials., **272-276**, 430–431 (2004).
- ^{55}Mn NMR study of $\text{La}_{1.2}\text{Sr}_{1.8-x}\text{Ca}_x\text{Mn}_2\text{O}_7$ ($x=0, 0.1, 0.2$).
Shimizu, K., Mizushima, T., Velázquez, M., Renard, J.-P., and Revcolevschi, A.
J. Magn. Magn. Mater., **272-276**, 430–431 (2004).
- NMR study of magnetic properties of $\text{Pr}_{1-x}\text{Sr}_x\text{MnO}_3$ ($0.2 \leq x \leq 0.5$).
Shimizu, K., Boujelben, Cheikh-Rouhou, W., A., Pierre, J., and Joubert, J.C.
J. Magn. Magn. Mater., **272-276**, 432–433 (2004).
- Neutron Diffraction Studies on the Liquid Te and As-Te Mixtures.
Maruyama, K., Hoshino, H., Ikemoto, H., and Endo, H.
Journal of Physical Society of Japan, **73**, 380–387 (2004).
- Determination of the three-dimensional structure of dislocations in silicon by synchrotron white X-ray topography combined with a topo-tomographic technique.
Kawado, S., Taishi, T., Iida, S., Suzuki, Y., Chikaura, Y., and Kajiwara, K.
J. Synchrotron Radiation, **11**, 304–308, (2004).
- Experimental evidence of the one-third magnetization plateau in the diamond chain compound $\text{Cu}_3(\text{CO}_3)_2(\text{OH})_2$.
Kikuchi, K., Fujii, Y., Chiba, M., Mitsudo, S., Idehara, T., and Kuwai, T.
J. Magn. Magn. Mater., **272-276**, 900–90 (2004).
- Specific heat of CeNi_2Ge_2 in wide-range of temperatures.
Kuwai, T., Takeuchi, M., Tsuchiya, T., Isikawa, Y., and Fukuhara, T.
J. Magn. Magn. Mater., **272-276**, 68–69 (2004).
- Magnetic, thermal and transport properties of $\text{Ce}(\text{Ni}_{1-x}\text{Cu}_x)_2\text{Al}_3$: the dominant role of electronic change.
Lu, Q., Sun, P., Huo, D., Mizushima, T., Isikawa, Y., and Sakurai, J.
J. Phys. Soc. Jpn., **73**, (No.3)681–686 (2004).
- Transport properties of $\text{Yb}_{0.8}\text{Y}_{0.2}\text{InCu}_4$ under high pressure.
Mitsuda, A., Ikeno, T., Nakanuma, Y., Kuwai, T., and Isikawa, Y.
J. Magn. Magn. Mater., **272-276**, 56–57 (2004).

- NMR study of magnetic properties of $\text{Pr}_{1-x}\text{Sr}_x\text{MnO}_3$ ($0.2 \leq x \leq 0.5$).
Shimizu, K., Boujelben, W., Cheikh-Rouhou, A., Pierre, J., and Joubert, J.C.
Journal of Magnetism and Magnetic Materials, **272-276**, 432-433 (2004).
- Schottky peaks in specific heat induced by electronic change in the antiferromagnetic-ferromagnetic alternating Kondo systems $\text{Ce}(\text{Pd}_{1-x}\text{M}_x)_2\text{Al}_3$ ($\text{M} = \text{Cu}$ or Ag).
Sun, P., Lu, Q., Kobayashi, K., Kuwai, T., and Isikawa, Y.
Physical Review B, **70**, 174429-8 (2004).
- Schottky peaks in specific heat induced by electronic change in the antiferromagnetic-ferromagnetic alternating systems $\text{Ce}(\text{Pd}_{1-x}\text{M}_x)_2\text{Al}_3$ ($\text{M} = \text{Cu}$ or Ag).
Sun, P., Lu, Q., Kobayashi, K., Kuwai, T., and Isikawa, Y.
Physical Review B, **70**, 174429-1-8 (2004).
- Observation of silicon front surface topographs of an ultralarge-scale-integrated wafer by synchrotron x-ray plane wave.
Suzuki, Y., Tsukasaki, Y., Kajiwara, K., Kawado, S., Iida, S. and Chikaura, Y.
J. Appl. Phys., **96**, 6259-6261 (2004).

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【研究概要】

素粒子から分子に至るまでの物質の成り立ち方を理論面実験面から研究している。理論グループでは、素粒子の質量の起源、初期宇宙の謎の解明、きたるべき素粒子理論の探究、宇宙暗黒物質の解明などを研究している。実験グループでは、マイクロ波から可視光までのコヒーレント光源を用いて、原子分子の超精密な分光実験を行い、冷却原子分子の実現、原子分子における素粒子論宇宙論的効果の検出への応用、星間分子の実験室分光、などを研究している。

【研究業績:論文】

2008

- Precision Measurements of Little Higgs Parameters at the International Linear Collider.
Asakawa, E., Asano, M., Fujii, K., Kusano, T., Matsumoto, S., Sasaki, R., Takubo, Y., and Yamamoto, H.
Phys. Rev. D, **79**, 075013 (2009).
- Neutralino dark matter in light Higgs boson scenario.
Asano, M., Matsumoto, S., Senami, M., and Sugiyama, H.
Phys. Lett. B, **663**, 330-333 (2008).
- Optical Feshbach Resonance Using the Intercombination Transition.
Enomoto, K., Kasa, K., Kitagawa, M., and Takahashi, Y.
Phys. Rev. Lett., **101**, 203201 (2008).
- Effective Potential of Higgs Field in Warped Gauge-Higgs Unification, Prog. Theor.
Haba, N., Matsumoto, S., Okada, N., and Yamashita, T.
Prog. Theor. Phys., **120**, 77-98 (2008).

- High energy cosmic rays from the decay of gravitino dark matter.
Ishiwata, K., Matsumoto, S., and Moroi, T.
Phys. Rev. D, **78**, 063505 (2008).
- Synchrotron radiation from the Galactic center in the decaying dark matter scenario.
Ishiwata, K., Matsumoto, S., and Moroi, T.
Phys. Rev. D, **79**, 043527 (2009).
- The microwave spectroscopy of trans-ethyl methyl ether in the first skeletal torsionally excited state.
Kobayashi, K., Matsui, T., Mori, N., Tsunekawa, S., and Ohashi, N.
Journal of Molecular Spectroscopy, **251**, 301-304 (2008).
- Testing the littlest Higgs model with T parity at the CERN Large Hadron Collider.
Matsumoto, S., Moroi, T., and Tobe, K.
Phys. Rev. D, **78**, 055018 (2008).
- Frequency measurement of pure rotational transitions of OD^- .
Yonezu, T., Matsushima, F., Takahashi, K., Onmaya, J., and Moriwaki, Y.
J. Mol. Spectrosc., **253**, 16-19 (2009).

2007

- CP violation due to multi Froggatt-Nielsen fields.
Kanemura, S., Matsuda, K., Ota, T., Petcov, S., Shindou, T., Takasugi, E., and Tsumura, K.
European Physical Journal C, **51**, 927-931 (2007).
- Determination of the s-Wave Scattering Length and the C_6 van der Waals Coefficient of ^{174}Yb via Photoassociation Spectroscopy.
Enomoto, K., Kitagawa, M., Kasa, K., Tojo, S., and Takahashi, Y.
Phys. Rev. Lett., **98**, 203201 (2007).
- Hyperfine-Structure-Induced Purely Long-Range Molecules.
Enomoto, K., Kitagawa, M., Tojo, S., and Takahashi, Y.
Phys. Rev. Lett., **100**, 123001 (2008).
- Two-color photoassociation spectroscopy of ytterbium atoms and the precise determinations of s-wave scattering lengths.
Kitagawa, M., Enomoto, K., Kasa, K., Takahashi, Y., Ciurylo, R., Naidon, P., and Julienne, P.S.
Phys. Rev. A, **77**, 012719 (2008).
- Unitarity bounds in the Higgs model including triplet fields with custodial symmetry.
Aoki, M., and Kanemura, S.
Phys. Rev. D, **77**, 095009-1-10 (2008).

- Fine structure changing cross section of Ba^+ ions in collisions with He atoms.
Moriwaki, Y., Matsuo, Y., Fukuyama Y., and Morita, N.
Jpn. J. Appl. Phys., **47**, 1757-1759 (2008).
- Formation and dissociation of Ba^{+*} He exciplexes at 3-25 K.
Fukuyama, Y., Moriwaki, Y., and Matsuo, Y.
Phys. Rev. A, **75**, 032725-1-8 (2007).
- 松尾由賀利, 福山祥光, 森脇喜紀.
レーザー誘起蛍光法によるイオン-原子分子低温衝突断面積の測定.
しょうとつ, **4**, 3-14 (2007).

2006

- Uncertainty in the leading order perturbative QCD calculations of B meson decays.
Kurimoto, T.
Physical Review D, **74**, 014027-1-17 (2006).
- Dimension-six top-Higgs interaction and its effect in collider phenomenology.
Kanemura, S., Nomura, D., and Tsumura, K.
Physical Review D, **74**, 076007 (2006).
- The spectrum of CH_2 near 1.36 and 0.92 microns: Re-evaluation of rotational level structure and perturbations in $a(010)$, J. Chem. Phys., **124**, 184320 (2006).
Kobayashi, K., Hall, G. E., and Sears, T.J.
- Torsionally Excited Methyl Formate in Orion KL.
Kobayashi, K., Ogata, K., Tsunekawa, S., and Takano, S.
Astrophys. J., **657**, L17-L19 (2007).
- Lepton flavor violation in Higgs boson decays under the rare tau decays.
Kanemura, S., Ota, T., and Tsumura, K.
Physical Review D, **73**, 016006 (2006).
- Laser spectroscopic study of Mg atoms in pressurized liquid helium.
Moriwaki, Y., Inui, K., Kobayashi, K., Matsushima, F., and Morita, N.
J. Mol. Struct., **786**, 112-117 (2006).
- Potential for measuring the $H^+ W^+ Z^0$ vertex from WZ fusion at the Large Hadron Collider.
Asakawa, E., Kanemura, S., and Kanzaki, J.
Physical Review D, **75**, 075022 (2007).
- High-Resolution Photoassociation Spectroscopy of Ultracold Ytterbium Atoms by Using the Intercombination Transition.
Tojo, S., Kitagawa, M., Enomoto, K., Kato, Y., Takasu, Y., Kumakura, M., and Takahashi, Y.
Phys. Rev. Lett., **96**, 153201 (2006).

- Laser spectroscopic measurements of fine structure changing cross sections of alkali earth ions with molecular hydrogen (H_2 , D_2).
Moriwaki, Y., Matsuo, Y., Fukuyama, Y., and Morita, N.
J. Phys. B: At. Mol. Opt. Phys., **39**, 4789–4797 (2006).
- Temperature and Pressure Control of Cold Helium Gas above Liquid Helium for Laser Spectroscopy of Atoms and Molecules at 3–30K.
Matsuo, Y., Fukuyama, Y., and Moriwaki, Y.
AIP Conf. Proc., **850**, 392–393 (2006).
- Gluonic contribution to $B \rightarrow \eta'$ form factors.
Y. Y. Charng, T. Kurimoto, and H. n. Li.
Physical Review D, **74**, 074024–1–10 (2006).

2005

- Enhancement of lepton flavor violation in a model with bi-maximal mixing at the grand unification scale.
Kanemura, S., Matsuda, K., Ota, T., Shindou, T., Takasugi, E., and Tsumura, K.
Physical Review D, **72**, 093004 (2005).
- Enhancement of WH production at hadron colliders in the two Higgs doublet model.
Brein, O., Asakawa, E., and Kanemura, S.
Physical Review D, **72**, 055017 (2005).
- Microwave Stark decelerator for polar molecules.
Enomoto, K., and Momose, T.
Phys. Rev. A, **72**, 061403(R) (2005).
- Frequency measurement of pure rotational transitions in the $v_2=1$ state of H_2O .
Matsushima, F., Tomatsu, N., Nagai, T., Moriwaki, Y., and Takagi, K.
J. Mol. Spectrosc., **235**, 190–195 (2006).
- Frequency measurement of pure rotational transitions of OH^- .
Matsushima, F., Yonezu, T., Okabe, T., Tomaru, K., and Moriwaki, Y.
J. Mol. Spectrosc., **235**, 261–264 (2006).
- Phase contribution to LFV.
Kanemura, S., Matsuda, K., Ota, T., Shindou, T., Tsumura, K., Takasugi, E.
Nuclear Physics B, Proc. Suppl., **143**, 524 (2005).
- Phase effects from the general neutrino Yukawa matrix on lepton flavor violation.
Kanemura, S., Matsuda, K., Ota, T., Shindou, T., Takasugi, E., and Tsumura, K.

Physical Review D, **72**, 055012 (2005) .

- Radiative corrections of neutrino mass matrix and lepton flavor violation processes.
Kanemura, S., Matsuda, K., Ota, T., Shindou, T., Tsumura, K., and Takasugi, E.
Nuclear Physics B, Proc. Suppl., **143**, 521(2005).
- Search for lepton flavor violating $\mu N \rightarrow X$ reactions with high energy muons.
Kanemura, S., Kuno, Y., Kuze, M., and Ota, T.
Nuclear Physics B, Proc. Suppl., **144**, 268-273 (2005).
- The HWZ vertex and single charged Higgs boson production via WZ fusion at the Large Hadron Collider.
Asakawa, E., and Kanemura, S.
Physics Letters B, **626**, 111 (2005).
- Laser spectroscopic investigation of Ca atoms in liquid helium: Comparison between spectral properties for liquid helium 3 and helium 4.
Moriwaki, Y., and Morita, N.
Eur. Phys. J. D, **33**, 323-327 (2005).
- Separation and Conversion Dynamics of Four Nuclear Spin Isomers of Ethylene.
Sun, Z.-D., Takagi, K., and Matsushima, F.
Science., **310**, 1938-1941 (2005).
- 孫振東, 森脇喜紀, 常川省三, 松島房和, 高木光司郎,
周波数可変炭酸ガスレーザーサイドバンド光源と飽和分光への応用,
分光研究, **55**, 3 (2006).

2004

- A Study of Lepton Flavor Violating $\mu N(eN) \rightarrow X$ Reactions in Supersymmetric Models.
Kanemura, S., Kuno, Y., Kuze, M., and Ota, T.
Physics Letters B, **607**, 165-171 (2005).
- Associated production of CP odd and charged Higgs bosons at hadron colliders.
Cao, Q.-H., Kanemura, S., and Yuan, C.P.
Phys. Rev. D, **69**, 075008, (2004).
- Bi-maximal mixing at GUT, the low energy data and the leptogenesis.
Kanemura, S., Matsuda, K., Nakano, H., Ota, T., Shindou, T., Takasugi, E., and Tsumura, K.
Nuclear Physics B, Proc. Suppl., **149**, 357-359, (2005).
- Electroweak baryogenesis and quantum corrections to the triple Higgs boson coupling.
Kanemura, S., Okada, Y., and Senaha, E.
Physics Letters B, **606**, 361-366 (2005).

- Emission spectra of alkali-metal(K,Na,Li) - He exciplexes in cold helium gas.
Enomoto, K., Hirano, K., Kumakura, M., Takahashi, Y., and Yabuzaki, T.
Phys. Rev. A, **69**, 012501 (2004).
- The far infrared spectrum of the ^{14}NH radical in its $X^3\Sigma^-$ state.
Flores Mijangos, J., Brown, J.M., Matsushima, F., Odashima, H., Takagi, K., Zink, L.R., and Evenson, K.M.
J. Mol. Spectrosc., **225**, 189-195 (2004).
- Higgs coupling constants as a probe of new physics.
Kanemura, S., Okada, Y., Senaha, Eibun., and Yuan, C.-P.
Physical Review D, **70**, 115002 (2004).
-
- New mechanism for the top bottom mass hierarchy.
Hashimoto, M., and Kanemura, S.
Physical Review D, **70**, 055006, (2004).
- Search for lepton flavor violation in the Higgs boson decay at a linear collider.
Kanemura, S., Matsuda, K., Ota, T., Shindou, T., Takasugi, E., and Tsumura, K.
Physics Letters B, **599**, 83-91, (2004).
- Search for lepton flavor violation via the intense high-energy muon beam.
Kanemura, S., Kuno, Y., Kuze, M., and Ota, T.
Nuclear Physics B, Proc. Suppl., **149**, 363-365, (2005).
- Laser induced fluorescence spectra of Ba^{+*} He exciplexes produced in cold He gas.
Fukuyama, Y., Moriwaki, Y., and Matsuo, Y.
Phys. Rev. A., **69**, 042505-1-6 (2004).
- Yukawa matrix for the neutrino and lepton flavor violation.
Kanemura, S., Matsuda, K., Ota, T., Shindou, T., Takasugi, E., and Tsumura, K.
Nuclear Physics B, Proc. Suppl., **149**, 360-362, (2005).
- A Nonfactorizable contributions to $B \rightarrow D^{(*)}M$ decays.
Keum, Y. Y., Kurimoto, T., Li, H. n., Lu, C. D., and Sanda, I.
Physical Review D, **69**•1, 094018 1-14 (2004).