

# PROGRAM

## Sep. 19/Room A

- Magnetic anisotropy** **10:45 ~ 12:15** Chair: S. Saito(Tohoku Univ.)
- 19aA-1 Ferromagnetic Resonance in Hexagonal-Crystal c-Plane (1): Angular Change in Anisotropy field  $H_a$   
°O. Kohmoto<sup>1</sup>, Y. Matsushima<sup>2</sup> (<sup>1</sup>Resona Lab., <sup>2</sup>Okayama Univ.)
- 19aA-2 Ferromagnetic Resonance in Hexagonal-Crystal c-Plane (2): Resonance Expression using  $H_a$   
°O. Kohmoto<sup>1</sup>, Y. Matsushima<sup>2</sup> (<sup>1</sup>Resona Lab., <sup>2</sup>Okayama Univ.)
- 19aA-3 Development of a Tuneless NMR System for Microscopic Evaluation of Permanent Magnetic Materials  
°K. Takao, T. Waki, Y. Tabata, H. Nakamura (Kyoto Univ.)
- 19aA-4 Synthesis and magnetic properties of  $M^{2+}$ - $Ti^{4+}$  highly-substituted BaM ferrites  
°Y. Nomura, K. Kakizaki, K. Kamishima (Saitama Univ.)
- 19aA-5 Synthesis and Magnetic Properties of Ca-Sr based W-type hexaferrite  
°T. Sekigawa, K. Kakizaki, K. Kamishima (Saitama Univ.)
- 19aA-6 Preparation and Magnetic Properties of Mg-Zn-Ti Spinel Ferrites  
°S. Yuan, K. Kakizaki, K. Kamishima (Saitama Univ.)

- Magneto-optics** **13:15 ~ 14:30** Chair: K. Kamishima(Saitama Univ.)
- 19pA-1 Kerr and magneto-refractive effects in near-infrared for Co/Ru multilayer films in reflection configuration  
°S. Saito<sup>1</sup>, H. Sato<sup>1</sup>, K. Ooki<sup>1</sup>, K. Akahane<sup>1</sup>, H. Uchida<sup>2</sup> (<sup>1</sup>Tohoku Univ., <sup>2</sup>Toyohashi Univ. Tech.)
- 19pA-2 Near-infrared wavelength dependence of magneto-refractive effect of Co/Ru multilayer film in transmission configuration  
°K. Ooki<sup>1</sup>, H. Sato<sup>1</sup>, K. Akahane<sup>1</sup>, H. Unhid<sup>2</sup>, S. Saito<sup>1</sup> (<sup>1</sup>Tohoku Univ., <sup>2</sup>Toyohashi Univ. Tech.)
- 19pA-3 Development of Magneto-optical Q-switch Laser with Kilowatts Power Output  
°R. Morimoto<sup>1</sup>, T. Goto<sup>1,2</sup>, J. Pritchard<sup>3</sup>, H. Takagi<sup>1</sup>, Y. Nakamura<sup>1</sup>, P. Lim<sup>1</sup>, M. Mina<sup>3</sup>, T. Taira<sup>4</sup>, H. Uchida<sup>1</sup>, M. Inoue<sup>1</sup>  
(<sup>1</sup>Toyohashi Univ. Tech., <sup>2</sup>JST-PREST, <sup>3</sup>Iowa Univ., <sup>4</sup>IMS)
- 19pA-4 Optical and magneto-optical responses of magneto-optical plasmonic structure with rectangularly arranged Au particles  
°Y. Kawaguchi<sup>1</sup>, Y. Mizutani<sup>1</sup>, Y. Itabashi<sup>1</sup>, T. Goto<sup>1,2</sup>, H. Takagi<sup>1</sup>, Y. Nakamura<sup>1</sup>, P. Lim<sup>1</sup>, H. Uchida<sup>1</sup>, M. Inoue<sup>1</sup>  
(<sup>1</sup>Toyohashi Univ. Tech., <sup>2</sup>JST-PREST)
- 19pA-5 Magneto-Optical Property of Bi-YIG Thin Film by The MOD Method  
°Y. Ouchi, K. Terashima, T. Taskase, K. Yamaguchi (Fukushima Univ.)

- Magnetism (Thin films, compounds)** **14:45 ~ 16:15** Chair: M. Shirai(Tohoku Univ.)
- 19pA-6 Magneto-capacitance of  $[GeTe/Sb_2Te_3]$  film  
°S. Sumi<sup>1</sup>, Y. Hirano<sup>1</sup>, B. Do<sup>1</sup>, H. Awano<sup>1</sup>, Y. Saito<sup>2</sup>, J. Tominaga<sup>2</sup> (<sup>1</sup>Toyota Tech. Inst., <sup>2</sup>AIST)
- 19pA-7 Improvement of magnetostriction of  $SmFe_2$  thin film for strain assisted magnetization reversal for MTJ  
°M. Tomita, Y. Ishitani, Y. Takamura, S. Nakagawa (Tokyo Inst. Tech.)
- 19pA-8 Electronic and magnetic properties of Iron-based superconductor Nb-doped  $Sr_2VFeAsO_{3-d}$   
°M. Yamaguchi, S. Iwasaki, M. Matoba, Y. Kamihara (Keio Univ.)
- 19pA-9 X-ray diffraction measurements at low temperatures under magnetic fields for itinerant-electron metamagnet  $LaFe_{12}B_6$  compound  
°S. Fujieda<sup>1</sup>, Y. Mitsui<sup>2</sup>, K. Koyama<sup>2</sup>, K. Fukamichi<sup>1</sup>, S. Suzuki<sup>1</sup> (<sup>1</sup>Tohoku Univ., <sup>2</sup>Kagoshima Univ.)
- 19pA-10 perovskite type transition metal formates  $(CH_3NH_3)[M(HCOO)_3]$ , ( $M=Mn, Co, Ni, Cu$ )  
°D. Sato<sup>1</sup>, T. Kida<sup>2</sup>, M. Hagiwara<sup>2</sup>, T. Fukuda<sup>1</sup>, N. Kamata<sup>1</sup>, Z. Honda<sup>1</sup> (<sup>1</sup>Saitama Univ., <sup>2</sup>Osaka Univ.)
- 19pA-11 Magnetic properties of pymca bridged honeycomb structured metal complexes  
°T. Kaizu<sup>1</sup>, A. Okutani<sup>2</sup>, T. Kida<sup>2</sup>, M. Hagiwara<sup>2</sup>, T. Fukuda<sup>1</sup>, N. Kamata<sup>1</sup>, Z. Honda<sup>1</sup> (<sup>1</sup>Saitama Univ., <sup>2</sup>Osaka Univ.)

- Magnetism (Theoretical analysis, ferroelectrics) 16:30 ~ 18:00** Chair: S. Fujieda(Tohoku Univ.)
- 19pA-12 Prediction of the magnetization in transition-metal binary alloys by means of machine learning  
°T. Kanemura, M. Shirai (Tohoku Univ.)
- 19pA-13 Theoretical design of Mn-based ordered alloys with high magnetization by lattice expansion  
°Y. Mitsuhashi, M. Tsujikawa, M. Shirai (Tohoku Univ.)
- 19pA-14 Time-resolved imaging of spin wave transmission through an air gap  
°K. Matsumoto<sup>1</sup>, I. Yoshimine<sup>2</sup>, K. Himeno<sup>1</sup>, T. Satoh<sup>1</sup> (<sup>1</sup>Kyushu Univ., <sup>2</sup>RIKEN)
- 19pA-15 Fabrication of highly qualified (Bi<sub>1-x</sub>Ba<sub>x</sub>)FeO<sub>3</sub> multiferroic thin films by using a pulsed DC reactive sputtering method and its magnetic and dielectric properties  
°S. Yoshimura (Akita Univ., JST-PREST)
- 19pA-16 Fabrication of ε-Fe<sub>2</sub>O<sub>3</sub> multiferroic thin films with high coercivity and saturation magnetization by using an ion-beam assisted sputtering method  
°S. Yoshimura (Akita Univ., JST-PREST)
- 19pA-17 Magnetic properties of micro-scale artificial magnets fabricated on ferroelectric substrate LiNbO<sub>3</sub>  
°A. Yamaguchi<sup>1</sup>, K. Ueda<sup>1</sup>, T. Nakashima<sup>1</sup>, Y. Utsumi<sup>1</sup>, K. Yamada<sup>2</sup> (<sup>1</sup>Univ. Hyogo, <sup>2</sup>Gifu Univ.)

### Sep. 19/Room C

#### Symposium "High performance magnets and evaluation techniques toward innovative development for next generation magnets" Chief Organizer: H. Fukunaga(Nagasaki Univ.)

- 13:00 ~ 14:45** Chair: T. Nishiuchi(Hitachi Metals)
- 19pC-1 Must for candidates of permanent magnets materials (30min)  
°H. Akai (Univ. of Tokyo)
- 19pC-2 Analysis of magnetic properties for 1-12 rare-earth intermetallics based on first-principles  
°T. Yoshioka<sup>1,2</sup>, D. Suzuki<sup>1</sup>, H. Tsuchiura<sup>1,2</sup> (<sup>1</sup>Tohoku Univ., <sup>2</sup>ESICMM)
- 19pC-3 The ThMn<sub>12</sub>-type iron rich compounds with high intrinsic magnetic properties as permanent magnet materials (30min)  
°Y. Hirayama<sup>1,2</sup>, Y. K. Takahashi<sup>1</sup>, S. Hirose<sup>1</sup>, K. Hono<sup>1</sup> (<sup>1</sup>NIMS, <sup>2</sup>AIST)
- 19pC-4 High-temperature stability of ThMn<sub>12</sub> magnet materials  
°K. Kobayashi<sup>1</sup>, D. Furusawa<sup>1</sup>, S. Suzuki<sup>1</sup>, T. Kuno<sup>1</sup>, K. Urushibata<sup>1</sup>, N. Sakuma<sup>2,3</sup>, M. Yano<sup>2,3</sup>, T. Shoji<sup>2,3</sup>, A. Kato<sup>2,3</sup>, A. Manabe<sup>3</sup> (<sup>1</sup>SIST, <sup>2</sup>TOYOTA Motor, <sup>3</sup>MagHEM)
- 19pC-5 Coercivity dependence on particle size in three ThMn<sub>12</sub>-type magnetic materials  
°T. Kuno<sup>1</sup>, K. Muramatsu<sup>1</sup>, S. Suzuki<sup>1</sup>, K. Urushibata<sup>1</sup>, K. Kobayashi<sup>1</sup>, N. Sakuma<sup>2,3</sup>, A. Kinoshita<sup>2,3</sup>, K. Yokota<sup>2,3</sup>, M. Yano<sup>2,3</sup>, T. Syouji<sup>2,3</sup>, A. Kato<sup>2,3</sup>, A. Manabe<sup>3</sup> (<sup>1</sup>SIST, <sup>2</sup>TOYOTA Motor, <sup>3</sup>MagHEM)
- 15:00 ~ 16:15** Chair: S. Sugimoto(Tohoku Univ.)
- 19pC-6 Nd-Fe-B permanent magnets with ultimate hard magnetic properties (30min)  
°K. Hono, H. Sepehri-Amin, T. T. Sasaki, T. Ohkubo (NIMS)
- 19pC-7 Large scale micromagnetic simulation and analysis of magnetization reversal within hot-deformed permanent magnet  
°H. Tsukahara<sup>1</sup>, K. Iwano<sup>1</sup>, C. Mitsumata<sup>2</sup>, T. Ishikawa<sup>1</sup>, K. Ono<sup>1</sup> (<sup>1</sup>KEK, <sup>2</sup>NIMS)
- 19pC-8 Proposal for coercivity mechanism in rare-earth magnets based on comparison between experiments on model-interface samples and ab-initio calculations  
°H. Kato<sup>1</sup>, K. Koike<sup>1</sup>, D. Ogawa<sup>1</sup>, M. Itakura<sup>2</sup>, Y. Ando<sup>3</sup> (<sup>1</sup>Yamagata Univ., <sup>2</sup>Kyushu Univ., <sup>3</sup>Tohoku Univ.)
- 19pC-9 Angular Dependence of Coercivity Derived from Alignment Dependence of Coercivity in Sintered Nd-Fe-B Magnets  
°Y. Matsuura<sup>1</sup>, T. Nakamura<sup>2</sup>, K. Sumitani<sup>2</sup>, K. Kajiwara<sup>2</sup>, R. Tamura<sup>3</sup>, K. Osamura<sup>1</sup>  
(<sup>1</sup>Research Institute for Applied Sciences, <sup>2</sup>JASRI/SPring-8, <sup>3</sup>Tokyo Univ. Sci.)

**Sep. 19/Room D**

**Symposium "Elucidation and application of new physical phenomena of magnetic texture"**

Chief Organizer: H. Awano(Toyota Tech. Inst.)

**10:00 ~ 12:00**

Chair: H. Uchida(Toyohashi Univ. Tech.)

- 19aD-1 Control of magnetic skyrmion: Theoretical design of skyrmion device (30min)  
°W. Koshibae, Y. Kaneko, J. Iwasaki, M. Kawasaki, Y. Tokura, N. Nagaosa (RIKEN CEMS)
- 19aD-2 Elucidation and application of current-induced domain wall motion (30min)  
°T. Ono (Kyoto Univ.)
- 19aD-3 Dzyaloshinskii-Moriya interaction at metallic bilayer interfaces (30min)  
°K. Nakamura<sup>1</sup>, P. Abdul-Muizz<sup>1,2</sup>, T. Akiyama<sup>1</sup>, T. Ito<sup>1</sup> (<sup>1</sup>Mie Univ., <sup>2</sup>Kyoto Univ.)
- 19aD-4 Co/Ni-nanowire based magnetic shift registers (30min)  
°T. Kondo, T. Shimada, M. A. Quinsat, M. Kado, Y. Ootera, N. Umetsu, S. Hashimoto, S. Nakamura (Toshiba)

**13:00 ~ 14:30**

Chair: H. Awano(Toyota Tech. Inst.)

- 19pD-1 The numerical analysis of standing spin wave configurations controlled with a domain wall in nanowires (30min)  
°X. Ya, M. Fukuzono, T. Tanaka, K. Matsuyama (Kyushu Univ.)
- 19pD-2 Chiral magnetism in thin film heterostructures (30min)  
°M. Hayashi (Univ. of Tokyo, NIMS)
- 19pD-3 Magnetic nanowire memory for realizing ultra-fast data transfer rate: Magnetic and magneto-optical detection of current-driven domain motion (30min)  
°M. Okuda, M. Kawana, Y. Miyamoto, N. Ishii (NHK)

**Symposium "Controlling magnetization by applying electric current and voltage"**

Chief Organizer: S. Mitani(NIMS)

**14:45 ~ 16:30**

Chair: S. Mitani(NIMS)

- 19pD-4 Recent progresses and future challenges in voltage-controlled magnetic anisotropy effect (30min)  
°T. Nozaki<sup>1</sup>, Y. Shiota<sup>1</sup>, A. Koziol-Rachwal<sup>1,2</sup>, M. Tsujikawa<sup>3,4</sup>, T. Yamamoto<sup>1</sup>, X. Xiandong<sup>5</sup>, T. Ohkubo<sup>5</sup>, T. Tsukahara<sup>6</sup>, S. Miwa<sup>6,7</sup>, M. Suzuki<sup>8</sup>, S. Tamaru<sup>1</sup>, H. Kubota<sup>1</sup>, A. Fukushima<sup>1</sup>, K. Hono<sup>5</sup>, M. Shirai<sup>3,4</sup>, Y. Suzuki<sup>1,6,7</sup>, S. Yuasa<sup>1</sup>  
(<sup>1</sup>AIST, <sup>2</sup>AGH Univ., <sup>3</sup>Tohoku Univ., <sup>4</sup>Center for Spintronics Research Network, Tohoku Univ., <sup>5</sup>NIMS, <sup>6</sup>Osaka Univ., <sup>7</sup>Center for Spintronics Research Network, Osaka Univ., <sup>8</sup>JASRI/SPRING-8)
- 19pD-5 Perpendicular magnetic anisotropy at Fe/MgAl<sub>2</sub>O<sub>4</sub> interfaces and its voltage effect  
Q. Xiang<sup>1,2</sup>, °H. Sukegawa<sup>1</sup>, M. Al-Mahdawi<sup>1</sup>, M. Belmoubarik<sup>1</sup>, Y. Sakuraba<sup>1</sup>, S. Kasai<sup>1</sup>, K. Hono<sup>1,2</sup>, S. Mitani<sup>1,2</sup>  
(<sup>1</sup>NIMS, <sup>2</sup>Univ. of Tsukuba)
- 19pD-6 The effect of Os or Ir layer insertion into MgO/Fe interface on the electric-field modulation of magnetic anisotropy  
°M. Tsujikawa<sup>1,2</sup>, M. Shirai<sup>1,2</sup> (<sup>1</sup>RIEC, Tohoku Univ., <sup>2</sup>CSRN, Tohoku Univ.)
- 19pD-7 Electric field control of magnetic anisotropy in bilayer contacts with Rashba-type spin-orbit interaction  
°J. Inoue<sup>1</sup>, Y. Miura<sup>2</sup>, S. Mitani<sup>3</sup> (<sup>1</sup>Tohoku Univ., <sup>2</sup>Kyoto Inst. of Tech, <sup>3</sup>NIMS)
- 19pD-8 Correlation between g-factor and magnetic anisotropy under the bias electric field  
T. Moriyama<sup>1</sup>, °T. Moriyama<sup>1</sup>, M. Kawaguchi<sup>2</sup>, K. Tanaka<sup>1</sup>, T. Koyama<sup>2</sup>, D. Chiba<sup>2</sup>, T. Ono<sup>1</sup> (<sup>1</sup>Kyoto Univ., <sup>2</sup>Univ. of Tokyo)

**Sep. 20/Room A**

**Medical treatment technology**

**9:00 ~ 10:30**

Chair: T. Nakagawa(Osaka Univ.)

- 20aA-1 Evaluation of magnetization properties in multi-core magnetic nanoparticle suspended in cellular medium  
°S. Ota<sup>1</sup>, N. Ohashi<sup>1</sup>, Y. Takemura<sup>2</sup> (<sup>1</sup>Shizuoka Univ., <sup>2</sup>Yokohama National Univ.)
- 20aA-2 Measurement of AC magnetization of magnetic nanoparticles perpendicular to the excitation direction  
°K. Nishimoto<sup>1</sup>, S. Ota<sup>2</sup>, T. Yamada<sup>1</sup>, Y. Takemura<sup>1</sup> (<sup>1</sup>Yokohama National Univ., <sup>2</sup>Shizuoka Univ.)

- 20aA-3 Measurement of bacteria using magnetic beads by switching magnetic field  
 °S. Yabukami<sup>1</sup>, H. Onodera<sup>1</sup>, H. Uetake<sup>1</sup>, Y. Sato<sup>1</sup>, K. Miyauchi<sup>1</sup>, G. Endo<sup>1</sup>, Y. Miura<sup>2</sup>, H. Takahashi<sup>2</sup>, T. Kodama<sup>2</sup>  
 (1Tohoku Gakuin Univ., 2JNS)
- 20aA-4 Relaxation responses of magnetic nanoparticles immobilized by hydrocolloid polymer (agar)  
 °S. Trisnanto<sup>1</sup>, G. Shi<sup>1</sup>, R. Takeda<sup>1</sup>, T. Yamada<sup>1</sup>, S. Ota<sup>2</sup>, Y. Takemura<sup>1</sup> (1Yokohama National Univ., 2Shizuoka Univ.)
- 20aA-5 Fabrication of magnetically navigated capsule-type medical device for stomach inspection  
 °T. Honda, S. Tanaka (Kyushu Inst. Tech.)
- 20aA-6 Power supply for medical implant by Wiegand pulse from magnetic wire used as coil-core  
 °K. Takahashi, A. Takebuchi, T. Yamada, Y. Takemura (Yokohama National Univ.)

**Medical imaging** **10:45 ~ 12:00** Chair: T. Honda(Kyushu Inst. Tech.)

- 20aA-7 Combined use of magnetic and other tracers for diagnosis of cancer metastasis  
 °A. Kuwahata<sup>1</sup>, K. Saeki<sup>1</sup>, M. Ahmed<sup>1</sup>, S. Chikaki<sup>1</sup>, M. Kaneko<sup>1</sup>, S. Yamaguchi<sup>1</sup>, W. Qiu<sup>1</sup>, M. Kusakabe<sup>1,2</sup>, M. Sekino<sup>1</sup>  
 (1Univ. of Tokyo, 2Matrix cell laboratory)
- 20aA-8 Dynamic hysteresis measurement of magnetic nanoparticles with alignment of magnetic easy-axis  
 °R. Takeda<sup>1</sup>, S. Ota<sup>2</sup>, T. Yamada<sup>1</sup>, Y. Takemura<sup>1</sup> (1Yokohama National Univ., 2Shizuoka Univ.)
- 20aA-9 Distribution of Magnetic Nanoparticles Anisotropy Energy Estimated from AC Susceptibility and Magnetic Relaxation  
 °A. L. Elrefai, T. Sasayama, T. Yoshida, K. Enpuku (Kyushu Univ.)
- 20aA-10 Evaluation of harmonic intensity of magnetic nanoparticles for magnetic particle imaging affected by particle size and structure  
 °Y. Ichikawa<sup>1</sup>, S. Ota<sup>2</sup>, R. Takeda<sup>1</sup>, T. Yamada<sup>1</sup>, I. Kato<sup>3</sup>, S. Nohara<sup>3</sup>, T. Yoshida<sup>4</sup>, K. Enpuku<sup>4</sup>, Y. Takemura<sup>1</sup>  
 (1Yokohama National Univ., 2Shizuoka Univ., 3Meito Sangyo, 4Kyushu Univ.)
- 20aA-11 Magnetic particle imaging of long circulating blood pool magnetic nanoparticles  
 °Y. Matsugi<sup>1</sup>, T. Nakamura<sup>1</sup>, S. Ota<sup>2</sup>, R. Takeda<sup>3</sup>, Y. Takemura<sup>3</sup>, I. Kato<sup>4</sup>, S. Nohara<sup>4</sup>, T. Sasayama<sup>1</sup>, T. Yoshida<sup>1</sup>, K. Enpuku<sup>1</sup>  
 (1Kyushu Univ., 2Shizuoka Univ., 3Yokohama National Univ., 4Meito Sangyo)

**Medical / Magnetic field effect** **13:00 ~ 14:30** Chair: K. Iramina(Kyushu Univ.)

- 20pA-1 Effects of magnetic fields on anticancer drug potency and drug uptake to multidrug-resistant cancer cells  
 °Y. Endo, D. Matsui, S. Yamada, M. Kakikawa (Kanazawa Univ.)
- 20pA-2 Preparation and heat evaluation of gold-plated LSMC perovskite sphere samples for magnetic hyperthermia  
 °M. Kobayashi, K. Fujita, Y. Akai, T. Nakagawa, S. Seino, T. Yamamoto (Osaka Univ.)
- 20pA-3 Evaluation of liquid-dispersion and AC magnetization property of magnetic PIC aggregate  
 °G. Shi<sup>1</sup>, S. Trisnanto<sup>1</sup>, K. Nakai<sup>2</sup>, S. Yusa<sup>2</sup>, T. Yamada<sup>1</sup>, S. Ota<sup>3</sup>, Y. Takemura<sup>1</sup>  
 (1Yokohama National Univ., 2Univ. Hyogo, 3Shizuoka Univ.)
- 20pA-4 Alternative magnetic fields might affect germination of wheat  
 °T. Nose<sup>1</sup>, S. Oue<sup>1</sup>, T. Hatta<sup>1</sup>, A. Hayashi<sup>2</sup>, Y. Hirata<sup>3</sup> (1Okayama Univ. Sci., 2Forestec, 3Hokkai-Gakuen Univ.)
- 20pA-5 Fabrication and magnetic property estimation of the 50-mm gap magnetic circuit type magnetic field generator for magnetic hyperthermia  
 °R. Hasegawa, N. Sato, T. Nakagawa, S. Seino, T. Yamamoto (Osaka Univ.)
- 20pA-6 The effect of magnetic and electric fields produced by a human body size applicator for hyperthermia  
 °T. Aoto<sup>1</sup>, T. Yamada<sup>1</sup>, S. Ota<sup>2</sup>, Y. Ikehata<sup>3</sup>, S. Yamada<sup>3</sup>, Y. Takemura<sup>1</sup>  
 (1Yokohama National Univ., 2Shizuoka Univ., 3Kanazawa Univ.)

**Sep. 20/Room B**

**Functional thin films** **10:30 ~ 12:00** Chair: T. Ogawa(Tohoku Univ.)

- 20aB-1 Fan-out element based on nano-magnet shift register  
 °H. Nomura, N. Yoshioka, R. Nakatani (Osaka Univ.)
- 20aB-2 Current-induced domain wall motion in Pt/Co/Tb-Co multilayered wire with inserted thin Co layer  
 °Y. Kurokawa<sup>1</sup>, S. Sumi<sup>2</sup>, H. Awano<sup>2</sup> (1Kyushu Univ., 2Toyota Tech. Inst.)
- 20aB-3 Large anomalous Nernst effect in Co<sub>2</sub>MnAl<sub>1-x</sub>Si<sub>x</sub> Heusler thin film and its origin  
 °Y. Sakuraba<sup>1</sup>, K. Hyodo<sup>2</sup>, S. Mitani<sup>1</sup>, A. Sakuma<sup>2</sup> (1NIMS, 2Tohoku Univ.)

- 20aB-4 Spin Seebeck voltage enhancement by inserting Ru layer into interface of oxidized magnetic material/nonmagnetic metal  
<sup>o</sup>F. Nakata<sup>1</sup>, R. Nakamura<sup>1</sup>, S. Inami<sup>1</sup>, H. Yuasa<sup>1,2</sup> (<sup>1</sup>Kyushu Univ., <sup>2</sup>JST-PREST)
- 20aB-5 Spectroscopic generalized magneto-optical ellipsometry of Py/Ag/Bi trilayers  
<sup>o</sup>S. Tomita<sup>1</sup>, P. Riego<sup>2,3</sup>, K. Murakami<sup>1</sup>, T. Kodama<sup>1</sup>, N. Hosoito<sup>1</sup>, H. Yanagi<sup>1</sup>, A. Berger<sup>2</sup>  
 (<sup>1</sup>NAIST, <sup>2</sup>CIC nanoGUNE, <sup>3</sup>UPV/EHU)
- 20aB-6 Microstructure dependent magnetization dynamics of polycrystalline YIG thin films  
<sup>o</sup>S. Pati, Y. Endo (Tohoku Univ.)

#### Particles

13:15 ~ 14:30

Chair: S. Tomita(NAIST)

- 20pB-1 Preparation of core/shell particles using sub-micron sized Fe-Pt particles  
<sup>o</sup>Y. Hayashi, K. Ishiyama (Tohoku Univ.)
- 20pB-2 Magnetic characterization of well-isolated magnetite nanoparticles  
<sup>o</sup>H. Mamiya<sup>1</sup>, H. Fukumoto<sup>2</sup>, J. Nishigaki<sup>2</sup>, J. Cuya<sup>2</sup>, B. Jeyadevan<sup>2</sup> (<sup>1</sup>NIMS, <sup>2</sup>Univ. Shiga Pref.)
- 20pB-3 Synthesis and characterization of magnetic property of Mn ferrite nanoparticles  
<sup>o</sup>R. Shigesawa, H. Latiff, M. Kishimoto, E. Kita, H. Yanagihara (Univ. of Tsukuba)
- 20pB-4 Rotational hysteresis loss analysis for SiO<sub>2</sub> coated  $\alpha$ "-Fe<sub>16</sub>N<sub>2</sub> nanoparticles  
<sup>o</sup>M. Tobise, S. Saito (Tohoku Univ.)
- 20pB-5 Columnar-structured assembly of iron-nitride nanoparticles fabricated by external magnetic and electric fields and its static and dynamic magnetic properties  
<sup>o</sup>T. Ogawa, Y. Honnami, Y. Endo (Tohoku Univ.)

#### Sep. 20/Room C

#### Symposium "High performance magnets and evaluation techniques toward innovative development for next generation magnets"

Chief Organizer: H. Fukunaga(Nagasaki Univ.)

9:00 ~ 10:00

Chair: M. Tokunaga(Former Hitachi Metals)

- 20aC-1 Development of Mn-based novel magnetic materials through lattice engineering (30min)  
<sup>o</sup>T. Shima<sup>1</sup>, M. Doi<sup>1</sup>, H. Okada<sup>1</sup>, M. Tsujikawa<sup>2</sup>, M. Shirai<sup>2</sup> (<sup>1</sup>Tohoku Gakuin Univ., <sup>2</sup>Tohoku Univ.)
- 20aC-2 Strain-induced magnetic anisotropy in spinel ferrites (30min)  
<sup>o</sup>H. Yanagihara (Univ. of Tsukuba)

10:15 ~ 12:00

Chair: H. Fukunaga(Nagasaki Univ.)

- 20aC-3 Recent progress and future development of synchrotron X-ray analysis of high-performance permanent magnets (30min)  
<sup>o</sup>T. Nakamura<sup>1,2</sup>, Y. Matsuura<sup>3</sup>, R. Tamura<sup>4</sup>, K. Sumitani<sup>1</sup>, K. Kajiwara<sup>1</sup>, K. Toyoki<sup>1</sup>, B. David<sup>1</sup>, H. Okazaki<sup>1</sup>, Y. Kotani<sup>1</sup>, S. Hirose<sup>2</sup> (<sup>1</sup>JASRI/SPring-8, <sup>2</sup>ESICMM/NIMS, <sup>3</sup>RIAS, <sup>4</sup>Tokyo Univ. Sci.)
- 20aC-4 High-throughput experiment of X-ray magnetic circular dichroism spectroscopy with machine learning  
<sup>o</sup>T. Ueno<sup>1</sup>, H. Hino<sup>2</sup>, A. Hashimoto<sup>3</sup>, Y. Takeichi<sup>3</sup>, K. Ono<sup>3</sup> (<sup>1</sup>QST, <sup>2</sup>Univ. of Tsukuba, <sup>3</sup>KEK)
- 20aC-5 Size-resolved FORC measurement using Small Angle Neutron Scattering  
 K. Saito<sup>1</sup>, T. Ueno<sup>2</sup>, M. Ito<sup>3</sup>, M. Yano<sup>3</sup>, T. Shoji<sup>3</sup>, F. Zhendong<sup>4</sup>, P. Vitaliy<sup>4</sup>, <sup>o</sup>K. Ono<sup>1</sup>  
 (<sup>1</sup>KEK, <sup>2</sup>NIMS, <sup>3</sup>TOYOTA Motor, <sup>4</sup>Julich Centre for Neutron Science)
- 20aC-6 Development of alternating magnetic force microscopy: Local magnetic domain analysis by advanced magnetic field imaging with high functionalities for high performance magnets (30min)  
<sup>o</sup>H. Saito, Y. Cao, Y. Zhao, Y. Suzuki, S. Yoshimura (Akita Univ.)
- 20aC-7 More accurate hysteresis curve measurement in large Nd-Fe-B sintered magnets  
<sup>o</sup>H. Nishio<sup>1</sup>, X. Yu<sup>2</sup>, M. Namba<sup>2</sup>, K. Machida<sup>2</sup> (<sup>1</sup>Research Institute for Measurement of Magnetic Materials, <sup>2</sup>Osaka Univ.)

**Sep. 20/Room D**

**Symposium "Controlling magnetization by applying electric current and voltage"**

Chief Organizer: S. Mitani(NIMS)

**9:15 ~ 10:00**

Chair: H. Yuasa(Kyushu Univ.)

- 20aD-1 Spin torque oscillator for micro-wave assisted recording (30min)  
°Y. Sakuraba, S. Bosu, W. Zhou, H. Sepheri-Amin, S. Kasai, K. Hono (NIMS)
- 20aD-2 Physical origin and theoretical limit of the phase stability of a spin torque oscillator stabilized by phase locked loop  
°S. Tamaru, H. Kubota, K. Yakushiji, A. Fukushima, S. Yuasa (AIST)

**10:15 ~ 12:00**

Chair: S. Mitani(NIMS)

- 20aD-3 Spin-orbit torque induced switching using antiferromagnets and its application to artificial neural networks (30min)  
°S. Fukami, A. Kurenkov, W. A. Borders, C. Zhang, S. Dutttagupta, H. Ohno (Tohoku Univ.)
- 20aD-4 Voltage-Control Spintronics Memory (VoCSM) for a High-density and High-speed Non-volatile Memory (30min)  
°N. Shimomura, H. Yoda, T. Inokuchi, K. Kouji, Y. Kato, A. Buyandalai, S. Shirotori, Y. Kamiguchi, K. Ikegami, S. Oikawa, H. Sugiyama, M. Shimizu, M. Ishikawa, A. Tiwari, Y. Saito, A. Kurobe (Toshiba)
- 20aD-5 Magnetization switching by voltage controlled DMI (30min)  
°H. Imamura, T. Nozaki, S. Yuasa, Y. Suzuki (AIST)
- 20aD-6 Voltage-induced precessional switching at zero bias magnetic field in a conically magnetized free layer  
°R. Matsumoto, T. Nozaki, S. Yuasa, H. Imamura (AIST)

**Magnetic imaging**

**13:45 ~ 14:30**

Chair: H. Nomura(Osaka Univ.)

- 20pD-1 Modeling of defect signal from slit part of steel plate  
°R. Tanaka, T. Sasayama, K. Enpuku (Kyushu Univ.)
- 20pD-2 Development of quantitative measurement method for large area magnetic field distribution using MO imaging plate with backlight utilizing polarization modulation method  
°Y. Nagakubo<sup>1</sup>, M. Sasaki<sup>2</sup>, S. Meguro<sup>3</sup>, M. Nishikawa<sup>1</sup>, T. Ishibashi<sup>1</sup> (<sup>1</sup>Nagaoka Univ. Tech., <sup>2</sup>OFFDIAGONAL, <sup>3</sup>NEOARK)
- 20pD-3 Development of Polarized Pulsed Neutron Imaging Technique at MLF J-PARC  
°K. Hiroi<sup>1</sup>, T. Shinohara<sup>1</sup>, H. Hayashida<sup>2</sup>, J. D. Parker<sup>2</sup>, Y. Su<sup>1</sup>, K. Oikawa<sup>1</sup>, T. Kai<sup>1</sup>, Y. Kiyonagi<sup>3</sup>  
(<sup>1</sup>JAEA, <sup>2</sup>CROSS, <sup>3</sup>Nagoya Univ.)

**Sep. 21/Room A**

**Symposium "Magnetization excitation on nanomagnet with microwaves and its application to storage devices"**

Chief Organizer: N. Kikuchi(Tohoku Univ.)

**9:00 ~ 10:00**

Chair: T. Hasegawa(Akita Univ.)

- 21aA-1 Development of microwave interferometer based ultra-high sensitivity ferromagnetic resonance measurement apparatus (30min)  
°S. Tamaru, H. Kubota, K. Yakushiji, A. Fukushima, S. Yuasa (AIST)
- 21aA-2 Magnetization Switching Assisted by Spin Wave Dynamics (30min)  
°T. Seki<sup>1,2</sup>, K. Takanashi<sup>1</sup> (<sup>1</sup>IMR, Tohoku Univ., <sup>2</sup>JST-PREST)

**10:15 ~ 11:15**

Chair: A. Furuya(Fujitsu)

- 21aA-3 Experimental Study on Microwave-Assisted Magnetization Switching: Circularly Polarized Microwave Field and Varying-Frequency Microwave Field (30min)  
°H. Suto, T. Kanao, T. Nagasawa, K. Mizushima, R. Sato (Toshiba)
- 21aA-4 Microwave assisted magnetic recording on ECC and AFC media (30min)  
°S. Greaves<sup>1</sup>, Y. Kanai<sup>2</sup>, H. Muraoka<sup>1</sup> (<sup>1</sup>Tohoku Univ., <sup>2</sup>Niigata Inst. Tech.)

- MTJ** **13:00 ~ 14:30** Chair: T. Seki(Tohoku Univ.)
- 21pA-1 Perpendicular magnetic tunnel junctions with the p-SAF structure having strong interlayer exchange coupling by the iridium spacer layer and their spin-transfer-torque switching properties  
°A. Sugihara, K. Yakushiji, A. Fukushima, H. Kubota, S. Yuasa (AIST)
- 21pA-2 Theoretical analysis of magnetic tunneling junctions with semiconductor barriers CuInSe<sub>2</sub> and CuGaSe<sub>2</sub>  
°K. Masuda<sup>1</sup>, Y. Miura<sup>1,2</sup> (<sup>1</sup>NIMS, <sup>2</sup>Kyoto Inst. of Tech)
- 21pA-3 Magneto-transport properties of fully epitaxial Fe/GaO<sub>x</sub>/Fe magnetic tunnel junctions fabricated by solid-phase epitaxy at low temperatures  
°N. Doko<sup>1,2</sup>, S. Narayananellore<sup>1</sup>, N. Matsuo<sup>1,2</sup>, H. Saito<sup>1</sup>, S. Yuasa<sup>1</sup> (<sup>1</sup>AIST, <sup>2</sup>Chiba Inst. Tech.)
- 21pA-4 Low resistance epitaxial magnetic tunnel junctions with an MgGa<sub>2</sub>O<sub>4</sub> spinel based barrier  
°H. Sukegawa<sup>1</sup>, Y. Kato<sup>2</sup>, M. Belmoubarik<sup>1</sup>, P. Cheng<sup>1,3</sup>, T. Daibou<sup>2</sup>, N. Shimomura<sup>2</sup>, Y. Kamiguchi<sup>2</sup>, J. Ito<sup>2</sup>, H. Yoda<sup>2</sup>,  
T. Ohkubo<sup>1</sup>, S. Mitani<sup>1,3</sup>, K. Hono<sup>1,3</sup> (<sup>1</sup>NIMS, <sup>2</sup>Toshiba, <sup>3</sup>Univ. of Tsukuba)
- 21pA-5 Inverse Tunnel Magnetocapacitance Effect in Fe/AlO<sub>x</sub>/Fe<sub>3</sub>O<sub>4</sub>  
°H. Kaiju<sup>1</sup>, T. Nagahama<sup>1</sup>, S. Sasaki<sup>1</sup>, T. Shimada<sup>1</sup>, O. Kitakami<sup>2</sup>, T. Misawa<sup>1</sup>, M. Fujioka<sup>1</sup>, J. Nishii<sup>1</sup>, G. Xiao<sup>3</sup>  
(<sup>1</sup>Hokkaido Univ., <sup>2</sup>Tohoku Univ., <sup>3</sup>Brown Univ.)
- 21pA-6 Buffer layer dependent magnetoresistance effect in Co<sub>2</sub>Fe<sub>0.4</sub>Mn<sub>0.6</sub>Si/MgO/Co<sub>50</sub>Fe<sub>50</sub> magnetic tunnel junctions  
°M. Sun<sup>1</sup>, T. Kubota<sup>1</sup>, S. Takahashi<sup>2</sup>, Y. Kawato<sup>2</sup>, Y. Sonobe<sup>2</sup>, K. Takanashi<sup>1</sup> (<sup>1</sup>Tohoku Univ., <sup>2</sup>Samsung Research Inst. Jpn.)
- Spin-dependent transport** **14:45 ~ 16:15** Chair: T. Taniyama(Tokyo Inst. Tech.)
- 21pA-7 Spin transport and relaxation in *n*-Ge  
Y. Fujita<sup>1</sup>, M. Yamada<sup>1</sup>, M. Tsukahara<sup>1</sup>, S. Yamada<sup>1</sup>, K. Sawano<sup>2</sup>, °K. Hamaya<sup>1</sup> (<sup>1</sup>Osaka Univ., <sup>2</sup>Tokyo City Univ.)
- 21pA-8 Microstructure and magneto-resistive properties of CPP-GMR spin-valves with Ag/InZnO/Zn spacer  
°T. Nakatani, T. Sasaki, S. Li, Y. Sakuraba, T. Furubayashi, K. Hono (NIMS)
- 21pA-9 Influence of Mn composition in Co<sub>2</sub>MnSi films on magnetoresistance characteristics of Co<sub>2</sub>MnSi-based current-perpendicular-to-plane spin valves  
°K. Inubushi<sup>1</sup>, M. Inoue<sup>2</sup>, B. Hu<sup>2</sup>, K. Moges<sup>2</sup>, K. Nakada<sup>1</sup>, M. Yamamoto<sup>2</sup>, T. Uemura<sup>2</sup> (<sup>1</sup>TDK, <sup>2</sup>Hokkaido Univ.)
- 21pA-10 Ferromagnetic layer thickness dependence of current perpendicular-to-plane giant magnetoresistance effect in Co<sub>2</sub>Fe<sub>0.4</sub>Mn<sub>0.6</sub>Si/L12-type Ag<sub>3</sub>Mg/Co<sub>2</sub>Fe<sub>0.4</sub>Mn<sub>0.6</sub>Si devices  
°T. Kubota, Y. Ina, Z. Wen, K. Takanashi (IMR, Tohoku Univ.)
- 21pA-11 Low-temperature growth and magnetic properties of all-epitaxial CoFe/Ge/Fe<sub>3</sub>Si vertical structures  
°S. Sakai<sup>1</sup>, M. Kawano<sup>1</sup>, M. Ikawa<sup>1</sup>, S. Oki<sup>1</sup>, H. Sato<sup>2</sup>, S. Yamada<sup>1</sup>, K. Hamaya<sup>1</sup> (<sup>1</sup>Osaka Univ., <sup>2</sup>Tokyo Electron)
- 21pA-12 Spin transport in all-epitaxial CoFe/Ge/Fe<sub>3</sub>Si vertical structures  
°M. Ikawa<sup>1</sup>, M. Kawano<sup>1</sup>, S. Sakai<sup>1</sup>, S. Oki<sup>1</sup>, H. Sato<sup>2</sup>, S. Yamada<sup>1</sup>, K. Hamaya<sup>1</sup> (<sup>1</sup>Osaka Univ., <sup>2</sup>Tokyo Electron)
- Spin orbit, Spin torque** **16:30 ~ 18:00** Chair: M. Tanaka(Nagoya Inst. Tech.)
- 21pA-13 Spin orbit torques in amorphous GdFeCo films  
°K. Kawakami, D. Oshima, T. Kato, S. Iwata (Nagoya Univ.)
- 21pA-14 Current induced domain wall movement of magnetic wires with various composition of Gd<sub>x</sub>-Fe<sub>1-x</sub> alloy  
°R. Ebisawa<sup>1</sup>, A. Kenichi<sup>2</sup>, D. Kato<sup>2</sup>, N. Funabashi<sup>2</sup>, K. Kuga<sup>2</sup>, Y. Akiyama<sup>1</sup>, K. Machida<sup>2</sup> (<sup>1</sup>Tokai Univ., <sup>2</sup>NHK)
- 21pA-15 Spin transfer torque magnetization switching of Co/Pd based multilayers with low Curie temperature  
°T. Kimura<sup>1</sup>, X. Dong<sup>1</sup>, D. Oshima<sup>1</sup>, T. Kato<sup>1</sup>, Y. Sonobe<sup>2</sup>, Y. Kawato<sup>2</sup>, S. Iwata<sup>1</sup>  
(<sup>1</sup>Nagoya Univ., <sup>2</sup>Samsung Research Inst. Jpn.)
- 21pA-16 Study on measurement method of Dzyaloshinskii-Moriya interaction by simulations  
°Y. Hirano<sup>1</sup>, K. Yamada<sup>2</sup>, Y. Nakatani<sup>1</sup> (<sup>1</sup>UEC, <sup>2</sup>Gifu Univ.)
- 21pA-17 Simulation Analysis of SpinRAM with Dzyaloshinskii-Moriya interaction  
°S. Takamatsu<sup>1</sup>, K. Yamada<sup>2</sup>, Y. Nakatani<sup>1</sup> (<sup>1</sup>UEC, <sup>2</sup>Gifu Univ.)
- 21pA-18 Emission Power Analysis of Spin-Torque Oscillator: Micromagnetic Simulation Study  
°T. Tanaka<sup>1</sup>, A. Furuya<sup>1</sup>, Y. Uehara<sup>1</sup>, K. Shimizu<sup>1</sup>, J. Fujisaki<sup>1</sup>, T. Ataka<sup>1</sup>, C. Yoshida<sup>1</sup>, H. Oshima<sup>2</sup> (<sup>1</sup>Fujitsu, <sup>2</sup>Fujitsu Labs.)

Sep. 21/Room B

**Compound thin films**

10:45 ~ 12:15

Chair: K. Ito(Tohoku Univ.)

- 21aB-1 The faraday-effect and transmittance of Co-MgF<sub>2</sub> granular film prepared by Co-evaporation  
°M. Miyamoto<sup>1,2</sup>, T. Kubo<sup>1</sup>, Y. Fujishiro<sup>2</sup>, K. Shiota<sup>2</sup>, T. Sato<sup>2</sup>, M. Sonehara<sup>2</sup> (<sup>1</sup>Citizen Finedevice, <sup>2</sup>Shinshu Univ.)
- 21aB-2 High frequency TMD effect in FeCo-MgF nanogranular films  
°K. Ikeda<sup>1</sup>, N. Kobayashi<sup>1</sup>, S. Yabukami<sup>2</sup>, K. Arai<sup>1</sup> (<sup>1</sup>DENJIKEN, <sup>2</sup>Tohoku Gakuin Univ.)
- 21aB-3 Magneto-optic effects of metal-fluoride nanogranular films with optical transparency  
°N. Kobayashi<sup>1</sup>, K. Ikeda<sup>1</sup>, H. Masumoto<sup>2</sup>, S. Takahashi<sup>2</sup>, S. Maekawa<sup>3</sup> (<sup>1</sup>DENJIKEN, <sup>2</sup>Tohoku Univ., <sup>3</sup>JAEA)
- 21aB-4 Quasi antiferromagnetic layer by using 90 degree magnetic coupling through magnetic oxide layer  
°G. Nagashima, Y. Hirayama, H. Yuasa (Kyushu Univ.)
- 21aB-5 Microstructure and magnetic properties of CoFe<sub>2</sub>O<sub>4</sub> thin films fabricated by sputtering method.  
°T. Kawakami, K. Kamishima, K. Kakizaki (Saitama Univ.)
- 21aB-6 Control of epitaxial strain and magnetic anisotropy in cobalt-ferrite thin films by buffer layers  
°H. Onoda<sup>1</sup>, J. Inoue<sup>1</sup>, H. Sukegawa<sup>2</sup>, S. Sharmin<sup>1</sup>, H. Yanagihara<sup>1</sup> (<sup>1</sup>Univ. of Tsukuba, <sup>2</sup>NIMS)

**Metal thin films**

13:00 ~ 14:30

Chair: H. Yanagihara(Univ. of Tsukuba)

- 21pB-1 The effect of the annealing condition on exchange bias properties of Mn<sub>2</sub>VAl/Fe bilayers  
°T. Tsuchiya, R. Kobayashi, T. Kubota, K. Takanashi (IMR, Tohoku Univ.)
- 21pB-2 Magnetic properties of CoNi superlattices on Ru under layers  
°N. Kikuchi, K. Ito, T. Seki, K. Takanashi (Tohoku Univ.)
- 21pB-3 Magnetostriction Behaviors of Single- and Poly-Crystalline Ni/Ni-Co Bi-Layer Films  
°K. Serizawa<sup>1</sup>, T. Kawai<sup>1</sup>, M. Ohtake<sup>1,2</sup>, M. Futamoto<sup>1</sup>, F. Kirino<sup>3</sup>, N. Inaba<sup>4</sup>  
(<sup>1</sup>Chuo Univ., <sup>2</sup>Kogakuin Univ., <sup>3</sup>Tokyo Univ. of Arts, <sup>4</sup>Yamagata Univ.)
- 21pB-4 Structure Analysis of Sm-Co<sub>1-x</sub>Cu<sub>x</sub> and Er-Co<sub>1-y</sub>Cu<sub>y</sub> Alloy Thin Films Formed on Cr(100) Single-Crystal Underlayer  
°M. Ohtake<sup>1,2</sup>, R. Ochiai<sup>2</sup>, A. Suzuki<sup>2</sup>, M. Futamoto<sup>2</sup>, K. Fumiyoshi<sup>3</sup>, N. Inaba<sup>4</sup>  
(<sup>1</sup>Kogakuin Univ., <sup>2</sup>Chuo Univ., <sup>3</sup>Tokyo Univ. of Arts, <sup>4</sup>Yamagata Univ.)
- 21pB-5 Investigation of magnetic inhomogeneous structures at interfaces in GdFeCo ferrimagnetic thin film  
°Y. Futakawa, S. E. Moussaoui, H. Yoshikawa, Y. Kasatani, A. Tsukamoto (Nihon Univ.)
- 21pB-6 Thickness Dependence of High-frequency Magnetic Properties in Fe-Ga Films  
°Y. Endo, T. Sakai, T. Miyazaki, Y. Shimada (Tohoku Univ.)

**Perpendicular magnetic films**

14:45 ~ 16:15

Chair: H. Sukegawa(NIMS)

- 21pB-7 Fabrication of L1<sub>0</sub>-FeNi on MgO substrate by using Pulsed Laser Deposition system  
°M. Saito<sup>1</sup>, H. Ito<sup>1</sup>, J. Ochiai<sup>1</sup>, A. Mori<sup>1</sup>, Y. Suzuki<sup>1</sup>, M. Tomita<sup>1</sup>, T. Miyamachi<sup>2</sup>, F. Komori<sup>2</sup>, T. Koganezawa<sup>3</sup>, M. Mizuguchi<sup>4</sup>,  
K. Takanashi<sup>4</sup>, M. Kotsugi<sup>1</sup> (<sup>1</sup>Tokyo Univ. Sci., <sup>2</sup>Univ. of Tokyo, <sup>3</sup>JASRI/SPring-8, <sup>4</sup>IMR, Tohoku Univ.)
- 21pB-8 Crystal orientation and magnetic properties of Pd-Sb added L1<sub>0</sub>-CoPt thin films prepared by RTA method  
°Y. Kokubun, K. Kamishima, K. Kakizaki (Saitama Univ.)
- 21pB-9 Influence of Cap-layer on the Structure of FePt Alloy Thin Films on VN and VC underlayers  
°T. Shimizu<sup>1</sup>, M. Ohtake<sup>1,2</sup>, M. Futamoto<sup>1</sup>, K. Fumiyoshi<sup>3</sup>, N. Inaba<sup>4</sup>  
(<sup>1</sup>Chuo Univ., <sup>2</sup>Kogakuin Univ., <sup>3</sup>Tokyo Univ. of Arts, <sup>4</sup>Yamagata Univ.)
- 21pB-10 Dependence of magnetic properties on different buffer layers of Mn<sub>x</sub>Ga thin films  
°Y. Takahashi, K. Sato, T. Shima, M. Doi (Tohoku Gakuin Univ.)
- 21pB-11 Thickness dependence of Fe buffer layer on magnetic properties for Mn<sub>x</sub>Ga thin films  
°K. Sato, Y. Takahashi, T. Shima, M. Doi (Tohoku Gakuin Univ.)
- 21pB-12 Epitaxial growth of antiferromagnetic MnN thin films and exchange-coupling properties  
°T. Yoshida, T. Hajiri, Y. Ni, S. Ishino, H. Asano (Nagoya Univ.)

**Hard magnetic films**

16:30 ~ 18:00

Chair: M. Kotsugi(Tokyo Univ. Sci.)

- 21pB-13 Stabilization of bct structure and uniaxial magnetocrystalline anisotropy of FeCoVC films  
°M. Sakamoto, K. Kumagai, K. Takahashi, S. Ishio, T. Hasegawa (Akita Univ.)



- 21pB-14 Magnetic properties of bct FeCo nanodots with uniaxial magnetocrystalline anisotropy  
 °T. Hasegawa, K. Kumagai, M. Sakamoto, Y. Nakamura, S. Ishio (Akita Univ.)
- 21pB-15 Improvement of maximum energy product of SmCo<sub>5</sub> multilayer for permanent magnet films  
 °W. Koganoki<sup>1</sup>, J. Tanaka<sup>1</sup>, K. Ohashi<sup>2</sup>, S. Nakagawa<sup>1</sup> (<sup>1</sup>Tokyo Inst. Tech., <sup>2</sup>ShinEtsu)
- 21pB-16 Estimation of Interlayer Exchange Coupling Constant in Nd<sub>2</sub>Fe<sub>14</sub>B/ Ni<sub>80</sub>Fe<sub>20</sub> Thin Film: A TRMOKE Study  
 °R. Mandal<sup>1,2</sup>, Y. K. Takahashi<sup>1,2</sup>, K. Ishioka<sup>2</sup>, T. Shima<sup>3</sup>, D. Ogawa<sup>1,2</sup>, T. Kato<sup>4</sup>, S. Hirose<sup>1,2</sup>, K. Hono<sup>1,2</sup>  
 (<sup>1</sup>ESICMM, <sup>2</sup>NIMS, <sup>3</sup>Tohoku Gakuin Univ., <sup>4</sup>Nagoya Univ.)
- 21pB-17 Relationship between metal substrates and properties of Nd-Fe-B/ $\alpha$ -Fe nano-dispersed film magnets prepared using PLD with high laser energy density  
 °H. Kondo, A. Yamashita, T. Yanai, M. Nakano, H. Fukunaga (Nagasaki Univ.)
- 21pB-18 Relationship between each oxide layer on Si substrates and properties of isotropic Nd-Fe-B thick-film magnets  
 °D. Shimizu, Y. Yamaguchi, A. Yamashita, T. Yanai, M. Nakano, H. Fukunaga (Nagasaki Univ.)

### Sep. 21/Room C

**Hard magnetic materials (Nd-Fe-B) 9:00 ~ 10:15** Chair: T. Nishiuchi(Hitachi Metals)

- 21aC-1 FORC analysis on Ga added Nd-Fe-B sintered magnets  
 °K. Miyazawa<sup>1</sup>, T. Yomogita<sup>1</sup>, S. Okamoto<sup>1,2</sup>, N. Kikuchi<sup>1</sup>, O. Kitakami<sup>1</sup>, T. Sasaki<sup>2</sup>, T. Ohukubo<sup>2</sup>, K. Hono<sup>2</sup>, Y. Takada<sup>3</sup>, T. Sato<sup>3</sup>, Y. Kaneko<sup>3</sup>, A. Kato<sup>4</sup> (<sup>1</sup>Tohoku Univ., <sup>2</sup>NIMS, <sup>3</sup>TOYOTA Central R&D Labs., <sup>4</sup>TOYOTA Motor)
- 21aC-2 Investigation for directional dependency of pinning effect of grain boundary phase using large-scale micromagnetic simulation  
 °H. Tsukahara<sup>1</sup>, K. Iwano<sup>1</sup>, C. Mitsumata<sup>2</sup>, T. Ishikawa<sup>1</sup>, K. Ono<sup>1</sup> (<sup>1</sup>KEK, <sup>2</sup>NIMS)
- 21aC-3 Development of Ne-Ce-Fe-B based melt-spun ribbons for UHM magnetization  
 °K. Murakami<sup>1</sup>, T. Todaka<sup>1</sup>, K. Hanashima<sup>2</sup>, H. Koumura<sup>2</sup> (<sup>1</sup>Oita Univ., <sup>2</sup>MinebeaMitumi)
- 21aC-4 Heavy Rare Earth Elements and Magnetic Properties of Grainboundary Modified Nd-Fe-B Sintered Magnets  
 °K. Machida, M. Namba, X. Yu, H. Nishio, M. Endo (Osaka Univ.)
- 21aC-5 Influence of microstructure of Nd-Fe-B magnet on coercivity at high temperatures  
 °T. Harada, T. Yanai, M. Nakano, H. Fukunaga (Nagasaki Univ.)

**Hard magnetic materials (Nano composites, Powder, Thin film)10:30 ~ 11:45** Chair: K. Machida(Osaka Univ.)

- 21aC-6 Magnetic properties of nanocomposite Nd<sub>2</sub>Fe<sub>14</sub>B/Mo/Fe-B multilayer films  
 °K. Ohashi<sup>1</sup>, T. Kamio<sup>1</sup>, K. Koike<sup>1</sup>, N. Inaba<sup>1</sup>, H. Kato<sup>1</sup>, D. Ogawa<sup>2</sup>, M. Kondo<sup>3</sup>, M. Itakura<sup>3</sup>, M. Oogane<sup>4</sup>, Y. Ando<sup>4</sup>  
 (<sup>1</sup>Yamagata Univ., <sup>2</sup>NIMS, <sup>3</sup>Kyushu Univ., <sup>4</sup>Tohoku Univ.)
- 21aC-7 Magnetic properties of anisotropic Sm-Co/ $\alpha$ -Fe nanocomposite thick film-magnets prepared by two-step annealing  
 °Y. Maehata, Y. Hurukawa, T. Yanai, M. Nakano, H. Fukunaga (Nagasaki Univ.)
- 21aC-8 High coercive Sm-Fe-N Zn-bonded magnets prepared using Zn fine powders with low oxygen content  
 °T. Shiraiwa<sup>1</sup>, Y. Nishijima<sup>1</sup>, M. Matsuura<sup>1</sup>, N. Teduka<sup>1</sup>, S. Sugimoto<sup>1</sup>, T. Shoji<sup>2</sup>, N. Sakuma<sup>2</sup>, K. Haga<sup>2</sup>  
 (<sup>1</sup>Tohoku Univ., <sup>2</sup>TOYOTA Motor)
- 21aC-9 Synthesis of MnAl alloy powder by Ca reduction diffusion process  
 °S. Sato, S. Kadota, S. Irie (TDK)
- 21aC-10 Reduction in cracks of Fe-Pt film-magnets prepared by an electroplating method  
 °T. Yanai, J. Honda, R. Hamamura, T. Masaki, K. Takashima, M. Nakano, H. Fukunaga (Nagasaki Univ.)

**Hard magnetic materials (Ferrite) 13:00 ~ 14:00** Chair: M. Nakano(Nagasaki Univ.)

- 21pC-1 Effect of target composition on the barium hexaferrite (0001) thin films  
 °R. Patel<sup>1</sup>, Y. Ikeda<sup>1</sup>, S. Sharmin<sup>1</sup>, E. Kita<sup>1,2</sup>, H. Yanagihara<sup>1</sup> (<sup>1</sup>Univ. of Tsukuba, <sup>2</sup>Ibaraki Nat. Coll. Tech)
- 21pC-2 Co valence and spin states in La-Co cosubstituted M-type ferrite: <sup>59</sup>Co-NMR study  
 °H. Nakamura<sup>1</sup>, K. Takao<sup>1</sup>, S. Okazaki<sup>1</sup>, T. Waki<sup>1</sup>, Y. Tabata<sup>1</sup>, H. Sakai<sup>2</sup>, C. Meny<sup>3</sup> (<sup>1</sup>Kyoto Univ., <sup>2</sup>JAEA, <sup>3</sup>IPCMS)
- 21pC-3 Observation of Spin Flip Transition of Ca-La M-type Ferrite by <sup>57</sup>Fe-NMR  
 °K. Takao, K. Uji, T. Waki, Y. Tabata, H. Nakamura (Kyoto Univ.)
- 21pC-4 Study on magnetic properties and local structure of SrMn<sub>x</sub>Zn<sub>2-x</sub>-W-type hexagonal ferrite  
 °K. Ota<sup>1</sup>, T. Nakagawa<sup>1</sup>, Y. Kobayashi<sup>2</sup>, A. Yonaga<sup>1</sup>, S. Seino<sup>1</sup>, T. Yamamoto<sup>1</sup> (<sup>1</sup>Osaka Univ., <sup>2</sup>Hitachi Metals)

**Soft magnetic materials** **14:15 ~ 16:00** Chair: S. Okamoto(Tohoku Univ.)

- 21pC-5 Effect of chloride ions on coercivity of electroplated Fe-Ni films  
°T. Yanai, K. Sugihara, K. Koda, K. Eguchi, K. Takashima, M. Nakano, H. Fukunaga (Nagasaki Univ.)
- 21pC-6 Magnetic Properties on Fe-(3-7)wt%Si alloys using High Purity Metallurgy  
S. Nakagawa<sup>1</sup>, K. Matsuyama<sup>1</sup>, °I. Sasaki<sup>1</sup>, C. Kaido<sup>2</sup>, M. Takezawa<sup>1</sup>, Y. Horibe<sup>1</sup>, H. Era<sup>1</sup>, S. Hata<sup>3</sup>, S. Kubo<sup>4</sup>, T. Ogawa<sup>5</sup>  
(<sup>1</sup>Kyushu Inst. Tech., <sup>2</sup>Kitakyusyu Nat. Coll. Tech., <sup>3</sup>Kyushu Univ., <sup>4</sup>Kagoshima Univ., <sup>5</sup>MERI-FITC)
- 21pC-7 Influence of Nb addition on magnetic properties of FeSiB thin films  
Y. Takeuchi<sup>1</sup>, °Y. Fujiwara<sup>1</sup>, M. Jimbo<sup>2</sup>, K. Maeda<sup>1</sup>, T. Kobayashi<sup>1</sup> (<sup>1</sup>Mie Univ., <sup>2</sup>Daido Univ.)
- 21pC-8 High resistive layer formation of Fe-based amorphous powder surface modified by acid solution process  
°N. Yabu<sup>1</sup>, K. Sugimura<sup>1</sup>, T. Sato<sup>1</sup>, M. Sonehara<sup>1</sup>, H. Mizusaki<sup>1,2</sup>  
(<sup>1</sup>Shinshu Univ., <sup>2</sup>Nagano Prefecture General Industrial Technology Center)
- 21pC-9 Improvement of Wide Area Longitudinal Kerr Imaging System by Backside-illuminated CMOS Camera  
°S. Meguro<sup>1</sup>, S. Saito<sup>2</sup> (<sup>1</sup>NEOARK, <sup>2</sup>Tohoku Univ.)
- 21pC-10 Synthesis and magnetic properties of Fe<sup>2+</sup>-Ti<sup>4+</sup> and Al<sup>3+</sup> substituted BaFe<sub>12</sub>O<sub>19</sub>  
°A. Yonezawa, K. Kakizaki, K. Kamishima (Saitama Univ.)
- 21pC-11 Magnetostriction Behaviors of Epitaxial Fe<sub>70</sub>Co<sub>30</sub> Alloy Thin Films Formed on MgO Substrates with Different Orientations  
°K. Serizawa<sup>1</sup>, T. Kawai<sup>1</sup>, M. Ohtake<sup>1,2</sup>, M. Futamoto<sup>1</sup>, F. Kirino<sup>3</sup>, N. Inaba<sup>4</sup>  
(<sup>1</sup>Chuo Univ., <sup>2</sup>Kogakuin Univ., <sup>3</sup>Tokyo Univ. of Arts, <sup>4</sup>Yamagata Univ.)

**Sep. 21/Room D**

**FG, Thin films, Single crystal sensors** **9:00 ~ 10:30** Chair: S. Hashi(Tohoku Univ.)

- 21aD-1 Spin-Valve GMR Magnetic Strain Sensor with FeSiB Free Layer  
°Y. Hashimoto, N. Yamamoto, T. Kato, D. Oshima, S. Iwata (Nagoya Univ.)
- 21aD-2 Meandering coplanar line type thin film sensor using SmCo film  
°S. Yabakami<sup>1</sup>, H. Uetake<sup>1</sup>, H. Onodera<sup>1</sup>, N. Kobayashi<sup>2</sup>, J. Hayasaka<sup>2</sup>, K. Arai<sup>2</sup> (<sup>1</sup>Tohoku Gakuin Univ., <sup>2</sup>DENJIKEN)
- 21aD-3 High frequency permeability measurement of hexagonal ferrite single crystal  
°F. Osanai<sup>1</sup>, S. Yabukami<sup>2</sup>, H. Yamada<sup>1</sup>, S. Utsumi<sup>3</sup>, Y. Yasukawa<sup>4</sup>, S. Yoshida<sup>5</sup>, Y. Endo<sup>5</sup>, H. Shimada<sup>6</sup>  
(<sup>1</sup>Sendai Nat. Coll. Tech., <sup>2</sup>Tohoku Gakuin Univ., <sup>3</sup>Tokyo Univ. Sci., Suwa, <sup>4</sup>Chiba Inst. Tech., <sup>5</sup>Tohoku Univ., <sup>6</sup>Toei Scientific Industrial)
- 21aD-4 Balancing Method for Fundamental-Mode Orthogonal Fluxgate (FM-OFG) Gradiometer  
°I. Sasada (Kyushu Univ.)
- 21aD-5 Miniaturization of Fluxgate Sensors by Magnetic Domain Structure Control of Tensioned Core Materials  
°H. Miyata<sup>1,2</sup>, R. Yamamoto<sup>1</sup>, Y. Morimoto<sup>1</sup>, M. Takezawa<sup>1</sup> (<sup>1</sup>Kyushu Inst. Tech., <sup>2</sup>MTI)
- 21aD-6 Sensitive measurements of magnetization dynamics in yttrium iron garnet for magnetic sensor applications  
°T. Koda<sup>1</sup>, S. Muroga<sup>2</sup>, Y. Endo<sup>3</sup>, T. Kurosawa<sup>4</sup> (<sup>1</sup>Oshima Nat. Coll. Tech., <sup>2</sup>Toyota Nat. Coll. Tech., <sup>3</sup>Tohoku Univ., <sup>4</sup>AIT)

**Thin films, Wire sensors** **10:45 ~ 12:15** Chair: Y. Endo(Tohoku Univ.)

- 21aD-7 Application of strain sensor using inverse-magnetostriction effect to vibration sensor  
°Y. Kubo, K. Arai, S. Hashi, K. Ishiyama (Tohoku Univ.)
- 21aD-8 Study on Lamination Structured Magneto-Impedance Sensor Using Conductive Layer  
°K. Kusunoki, H. Yokoyama, S. Hashi, Y. Hayashi, K. Ishiyama (Tohoku Univ.)
- 21aD-9 Measurement of domain wall velocity in magnetic wire using MI sensor  
Y. Tanamura, H. Hoshiyama, A. Takebuchi, N. Fujinaga, T. Yamada, °Y. Takemura (Yokohama National Univ.)
- 21aD-10 Battery-less operation of Hall sensor by energy harvesting from a single Wiegand pulse  
°N. Fujinaga, A. Takebuchi, T. Yamada, Y. Takemura (Yokohama National Univ.)
- 21aD-11 Higher output voltage from energy harvesting element using compound magnetic wire with ferrite core  
°T. Sakai, A. Takebuchi, T. Yamada, Y. Takemura (Yokohama National Univ.)
- 21aD-12 0.6 mm vibration sensor without power supply using magnetic wire for detection of heart beat  
°I. Matsuzawa, A. Takebuchi, T. Yamada, Y. Takemura (Yokohama National Univ.)

- High-frequency wave** 13:00 ~ 14:30 Chair: N. Kobayashi(DENJIKEN)
- 21pD-1 Measurement of near magnetic field around high frequency circuit element using burst modulated pulsed laser  
°Y. Matsumoto, D. Tatsuoka, K. Arai, S. Hashi, Y. Hayashi, K. Ishiyama (Tohoku Univ.)
- 21pD-2 Development of New Measurement Method for Magnetostriction of Magnetic Thin Film  
°Y. Endo<sup>1</sup>, O. Mori<sup>2</sup>, S. Yabukami<sup>3</sup>, R. Utsumi<sup>2</sup>, Y. Shimada<sup>2</sup>  
 (1Tohoku Univ., 2Toei Scientific Industrial, 3Tohoku Gakuin Univ.)
- 21pD-3 Development of magnetic thin film high frequency characteristic evaluation method of wafer  
°O. Mori<sup>1</sup>, Y. Endo<sup>2</sup>, Y. Shimada<sup>2</sup>, S. Yabukami<sup>3</sup>, R. Utsumi<sup>1</sup>  
 (1Toei Scientific Industrial, 2Tohoku Univ., 3Tohoku Gakuin Univ.)
- 21pD-4 Equivalent circuit of ferrite loaded inverse L type wide band UHF antenna  
J. Mieda, K. Shinoda, M. Yonehara, K. Nakahara, H. Kurisu, °S. Yamamoto (Yamaguchi Univ.)
- 21pD-5 Demagnetization correction of complex permeability of magnetic slab measured by MSL  
S. Takeda<sup>1</sup>, °S. Yamasaki<sup>2</sup> (1Magnontech, 2KEYCOM)
- 21pD-6 Consideration of Skin Effect Suppression in Cylinder Multi-layer Transmission Line with Negative Permeability Material  
°R. Moriyama, Y. Aizawa, Y. Kurokawa, H. Nakayama (Nat. Ins. Tech. Nagano Coll.)

- Imaging, Measurements** 14:45 ~ 16:15 Chair: S. Yabukami(Tohoku Gakuin Univ.)
- 21pD-7 Detection of reversible magnetic domain wall movement by alternating magnetic force microscopy for NdFeB sintered magnets  
Y. Cao<sup>1</sup>, Y. Zhao<sup>1</sup>, S. Yoshimura<sup>1</sup>, T. Maki<sup>2</sup>, T. Nishiuchi<sup>2</sup>, °H. Saito<sup>1</sup> (1Akita Univ., 2Hitachi Metals)
- 21pD-8 Fabrication of superparamagnetic Co-Gd<sub>2</sub>O<sub>3</sub> granular films with high susceptibility for alternating magnetic force microscopy for high magnetic field imaging  
°Y. Suzuki, Y. Cao, S. Yoshimura, H. Saito (Akita Univ.)
- 21pD-9 Development of high resolution soft magnetic tips for alternating magnetic force microscopy :thin Fe-based amorphous films with high magnetostriction  
°Y. Akaishi, M. Makarova, K. S. Rao, S. Yoshimura, H. Saito (Akita Univ.)
- 21pD-10 Measurement of magnetization curve of MFM tips by pulse magnetic field MFM  
°K. Kudo, K. S. Rao, S. Yoshimura, H. Saito (Akita Univ.)
- 21pD-11 Influence of Sensor Positioning Accuracy on Signal Source Estimation of Magnetoencephalography  
°D. Oyama, Y. Adachi, G. Uehara (Kanazawa Inst. Tech.)
- 21pD-12 Uniaxial torque curve of hexagonal Co bulk single crystal measured by torque magnetometer capable for 10<sup>5</sup> dyne • cm  
°S. Nakamura<sup>1</sup>, K. Sato<sup>1</sup>, S. Kinno<sup>1</sup>, Y. Sotome<sup>1</sup>, S. Hinata<sup>1</sup>, T. Kikuchi<sup>2</sup>, K. Tamakawa<sup>3</sup>, T. Ogawa<sup>1</sup>, S. Saito<sup>1</sup>  
 (1Tohoku Univ., 2Hayama, 3TAMAKAWA)

**Sep. 22/Room A**

- Perpendicular magnetic anisotropy, Volatage effect** 9:00 ~ 10:15 Chair: K. Hamaya(Osaka Univ.)
- 22aA-1 Electric-field induced XMCD in Ni/Cu multilayer  
°J. Okabayashi<sup>1</sup>, T. Taniyama<sup>2</sup> (1The Univ. Tokyo, 2Tokyo Inst. Tech.)
- 22aA-2 GMR effect in Ir-SAF structure  
°A. Fukushima, A. Sugihara, K. Yakushiji, H. Kubota, S. Yuasa (AIST)
- 22aA-3 Change of Voltage-controlled Magnetic Anisotropy for Tb-Fe-Co/MgO/Gd-Fe MTJ Devices  
°T. Ueno<sup>1</sup>, H. Kinjo<sup>2</sup>, N. Funabashi<sup>2</sup>, S. Aso<sup>2</sup>, D. Kato<sup>2</sup>, K. Aoshima<sup>2</sup>, K. Kuga<sup>2</sup>, M. Motohashi<sup>1</sup>, K. Machida<sup>2</sup>  
 (1Tokyo Denki Univ., 2NHK)
- 22aA-4 Fabrication of magnetic tunnel junction multilayer with perpendicularly magnetized Co<sub>2</sub>FeSi films  
K. Shinohara, °Y. Stutler, Y. Takamura, S. Nakagawa (Tokyo Inst. Tech.)
- 22aA-5 Thickness dependence of perpendicular magnetic anisotropy of D<sub>022</sub>-Mn<sub>3</sub>Ge films  
°T. Yabushita<sup>1</sup>, N. Matsushita<sup>1</sup>, Y. Takamura<sup>1</sup>, Y. Kawato<sup>2</sup>, Y. Sonobe<sup>2</sup>, S. Nakagawa<sup>1</sup>  
 (1Tokyo Inst. Tech., 2Samsung Research Inst. Jpn.)
- 22aA-6 Withdrawn

- Magnetic domain, Magnetization dynamics** **10:45 ~ 12:00** Chair: S. Nakagawa(Tokyo Inst. Tech.)
- 22aA-7 Study of current-induced magnetic domain movement on ferromagnetic multilayer wire with antiferromagnetic coupling  
 °M. Tanaka<sup>1</sup>, H. Hamada<sup>1</sup>, M. Shimazaki<sup>1</sup>, S. Sumitomo<sup>1</sup>, S. Honda<sup>2</sup>, K. Mibu<sup>1</sup>, H. Awano<sup>3</sup>  
 (1Nagoya Inst. Tech., 2Kansai Univ., 3Toyota Tech. Inst.)
- 22aA-8 Detecting antiferromagnetic moment in Heusler-type ferromagnet/antiferromagnet epitaxial bilayers using anisotropic magnetoresistance  
 °T. Hajiri, M. Matsushita, N. Yuan-Zhi, H. Asano (Nagoya Univ.)
- 22aA-9 Computer simulation of an Antiferromagnetic Domain Wall Motion by a Slope Electric Field  
 °K. Kubota<sup>1</sup>, K. Yamada<sup>2</sup>, Y. Nakatani<sup>1</sup> (1UEC, 2Gifu Univ.)
- 22aA-10 Magnetic domain microscope with micrometer-spot laser for measurement of local magnetization hysteresis  
 °Y. Odagiri<sup>1</sup>, E. Yanagisawa<sup>1</sup>, S. Meguro<sup>1</sup>, S. Saito<sup>2</sup> (1NEOARK, 2Tohoku Univ.)
- 22aA-11 Improvement of write error rate in voltage-induced magnetization switching  
 °T. Ikeura<sup>1,2</sup>, Y. Shiota<sup>1</sup>, T. Yamamoto<sup>1</sup>, T. Nozaki<sup>1</sup>, Y. Suzuki<sup>1,3</sup>, S. Yuasa<sup>1</sup> (1AIST, 2Univ. of Tsukuba, 3Osaka Univ.)

**Sep. 22/Room B**

- Power magnetics • Motor** **9:15 ~ 10:30** Chair: T. Todaka(Oita Univ.)
- 22aB-1 A Study on Analysis of Basic Property of Axial Gap Induction Motor  
 °R. Sakai, Y. Yoshida, K. Tajima (Akita Univ.)
- 22aB-2 Development of a High Efficiency Rare Earth Free Motor by Three Dimensional Magnet Arrangement  
 °H. Saito, Y. Yoshida, K. Tajima (Akita Univ.)
- 22aB-3 Performance Calculation of Field-Winding type Claw-Pole Motor based on Reluctance Network Analysis  
 °Y. Ichikawa<sup>1</sup>, K. Nakamura<sup>1</sup>, S. Jung<sup>2</sup>, N. Kurimoto<sup>2</sup> (1Tohoku Univ., 2DENSO)
- 22aB-4 Hysteresis Modeling for Reluctance Network Analysis  
 °Y. Hane, H. Tanaka, K. Nakamura (Tohoku Univ.)
- 22aB-5 Electromagnetic and thermal Coupled Analysis for PM Motor based on Reluctance Network Analysis  
 °K. Kawamura, K. Nakamura (Tohoku Univ.)

- Power magnetics** **10:45 ~ 11:45** Chair: K. Nakamura(Tohoku Univ.)
- 22aB-6 Fundamental Study on Heat Treatment Effect of Non-oriented Electrical Steel Sheets in Magnetic Field  
 °K. Kouhara<sup>1</sup>, T. Kinoshita<sup>2</sup>, H. Shimoji<sup>3</sup>, T. Sato<sup>1</sup>, T. Todaka<sup>1</sup> (1Oita Univ., 2SHI, 3Oita Idus. Rese. Insti)
- 22aB-7 Iron loss estimation of amorphous wound core with lap-joint for high-frequency transformers  
 °N. Kurita, T. Hatakeyama, M. Kimura (Hitachi)
- 22aB-8 Evaluation of building factor of amorphous magnetic material  
 °K. Inoue, T. Todaka, T. Sato (Oita Univ.)
- 22aB-9 Magnetic Field Analysis for Micro processing of Flat Plate Utilizing Magnetic Compound Fluid  
 °S. Ikeda, H. Yamamoto, T. Shimizu, K. Nishijima, Y. Sakurai, H. Nishida (Toyama Nat. Coll. Tech.)

**Symposium "Requirement for magnetism and magnetic material research excited by power electronics equipment"**

Chief Organizer: C. Mishima(Aichi Steel)

- 13:00 ~ 14:30** Chair: S. Odawara(Kitami Inst. Tech.)
- 22pB-1 Collaboration and Invisible Gap Between Magnetics & Power Electronics Researchers (30min)  
 °M. Yamaguchi (Tohoku Univ.)
- 22pB-2 パワーエレクトロニクス技術から見た磁気・磁性材料への期待 (30min)  
 °T. Shimizu (Tokyo Metropolitan Univ.)
- 22pB-3 Recent progress in Fe-based amorphous alloy and nanocrystalline alloys for use in motor cores (30min)  
 °S. Nakajima<sup>1</sup>, D. Azuma<sup>1</sup>, Y. Ogawa<sup>1</sup>, R. Hasegawa<sup>2</sup> (1Hitachi Metals, 2Metglas)
- 14:45 ~ 16:15** Chair: M. Yamaguchi(Tohoku Univ.)
- 22pB-4 Soft Ferrite Materials in Power Electronics (30min)  
 °I. Nakahata (TDK)

- 22pB-5 Magnetic material and magnetic measurement of the traction electric motor for high efficiency and miniaturization (30min)  
°H. Nakai (TOYOTA Central R&D Labs.)
- 22pB-6 Required Magnetic Material Excited by Power Electronics Equipment (30min)  
°K. Fujisaki (Toyota Tech. Inst.)

**Sep. 22/Room C**

- FePt media** **9:00 ~ 10:30** Chair: D. Oshima(Nagoya Univ.)
- 22aC-1 Reduction of Fe dead layer with nitrated under layer in formation of  $L1_0$ - FePt fabricated by Rapid Thermal Annealing  
°K. Miyoshi, M. Tanaka, Y. Futakawa, A. Tsukamoto (Nihon Univ.)
- 22aC-2 Increase of FePt particles surface coverage by multiple particles nucleation with nano-template substrate  
°M. Tanaka, K. Miyoshi, A. Tsukamoto (Nihon Univ.)
- 22aC-3 Compositional dependency of areal density of grains and coercivity for isolated  $L1_0$  - FePt grains on nano silica particle structured substrate with Rapid thermal annealing method  
°T. Makino, Y. Futakawa, A. Tsukamoto (Nihon Univ.)
- 22aC-4 Formation of high coercivity particle array by Rapid Thermal Annealing of monodisperse FePt periodic structure  
°T. Naeki, M. Tanaka, T. Makino, H. Yoshikawa, A. Tsukamoto (Nihon Univ.)
- 22aC-5 Bumpy underlayer for controlling orientation and promoting columnar growth of  $L1_0$  FePt-based granular media  
°A. Shimizu, S. Hinata, T. Okada, S. Saito (Tohoku Univ.)
- 22aC-6 Growth Mechanism of  $L1_0$ -ordered FePt Epitaxial Magnetic Thin Films  
°M. Futamoto, T. Shimizu, M. Nakamura, M. Ohtake (Chuo Univ.)

- Magnetic recording media** **10:45 ~ 11:45** Chair: A. Tsukamoto(Nihon Univ.)
- 22aC-7 Crystal structure and magnetic properties for Co-Y film for heat assisted magnetic recording  
°S. Hinata, K. Hayashishita, S. Saito (Tohoku Univ.)
- 22aC-8 Effect of mixing different oxides on magnetic properties and microstructure of CoPt-B<sub>2</sub>O<sub>3</sub> granular media  
°K. K. Tham<sup>1</sup>, R. Kushibiki<sup>1,2</sup>, S. Hinata<sup>2</sup>, S. Saito<sup>2</sup> (<sup>1</sup>TANAKA, <sup>2</sup>Tohoku Univ.)
- 22aC-9 FORC analysis of MnGa bit patterned film fabricated by ion irradiation  
°D. Oshima, T. Kato, S. Iwata (Nagoya Univ.)
- 22aC-10 Local magnetic state of ion-irradiation  $L1_0$ -MnGa bit patterned films probed by scanning X-ray magnetic circular dichroism microscope  
°T. Ishikawa<sup>1</sup>, K. Fukuta<sup>1</sup>, D. Oshima<sup>1</sup>, T. Kato<sup>1</sup>, T. Nakamura<sup>2</sup>, Y. Kotani<sup>2</sup>, K. Toyoki<sup>2</sup>, S. Iwata<sup>1</sup>  
(<sup>1</sup>Nagoya Univ., <sup>2</sup>JASRI/SPring-8)

- MAMR** **13:00 ~ 14:15** Chair: H. Suto(Toshiba)
- 22pC-1 Microwave assisted switching effect for CoCrPt granular perpendicular media  
°K. Shimada, T. Shimatsu, N. Kikuchi, S. Okamoto, O. Kitakami (Tohoku Univ.)
- 22pC-2 Magnetization switching of layer structured magnetic dots under the assistance of microwave fields  
°D. Kanahara, S. Okamoto, N. Kikuchi, O. Kitakami, T. Shimatsu (Tohoku Univ.)
- 22pC-3 Micromagnetic analysis of the effect of external field rise time on STO oscillation for MAMR  
°R. Itagaki<sup>1</sup>, Y. Kanai<sup>1</sup>, S. Greaves<sup>2</sup>, H. Muraoka<sup>2</sup> (<sup>1</sup>Niigata Inst. Tech., <sup>2</sup>Tohoku Univ.)
- 22pC-4 Effect of Exchange Coupling between Top & Bottom Layers for Dual Layer in Microwave Assisted Magnetic Recording  
°T. Kikuchi, G. Simon, H. Muraoka (Tohoku Univ.)
- 22pC-5 Speed-Up of STO Micromagnetic Simulator Using Supercomputer FX10  
°M. Arai, H. Akagi, K. Yoshida (Kogakuin Univ.)

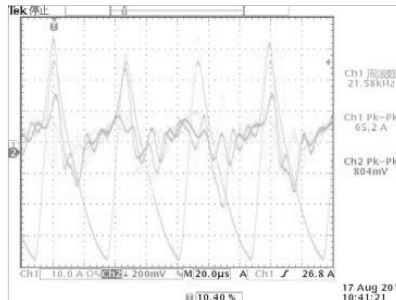
- Read/Write Technologies** **14:30 ~ 15:45** Chair: T. Kato(Nagoya Univ.)
- 22pC-6 Improvement of write head for PMR  
°Y. Nakamura<sup>1</sup>, R. Itagaki<sup>2</sup>, Y. Kanai<sup>2</sup> (<sup>1</sup>Tohoku Univ., <sup>2</sup>Niigata Inst. Tech.)
- 22pC-7 Readback resolution of dual-layer recording  
°J. Saito, H. Muraoka (Tohoku Univ.)

- 22pC-8 Micromagnetic simulation of selective resonant readout of two-layer antiferromagnetically-coupled recording magnetization using a spin-torque oscillator  
°T. Kanao, H. Suto, T. Nagasawa, K. Mizushima, R. Sato (Toshiba)
- 22pC-9 High efficiency excitation of All-Optical magnetization Switching with increasing of effective optical absorption in magnetic layer  
°T. Iisaka, H. Yoshikawa, Y. Futakawa, A. Tsukamoto (Nihon Univ.)
- 22pC-10 Reduction effect of All Optical magnetization Switching threshold in GdFeCo stacked on Pt  
°H. Yoshikawa, S. E. Moussaoui, Y. Kasatani, Y. Futakawa, A. Tsukamoto (Nihon Univ.)

# 短パルス・高周波磁場測定に特化したホール素子式ガウスメーター



測定例: 電磁調理器の漏れ磁場測定



測定波形

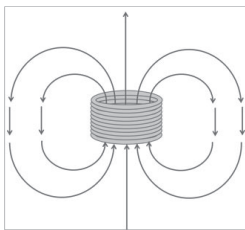
— コイル電流 10A/DIV  
— 発生磁場 20mT/DIV

## ホール素子磁気センサーの特徴

- ・磁場発生源のベクトル方向を正確に検出・・・他方式のセンサーにない高い指向性がホール素子の特徴です。
- ・極小エリアの磁場を正確に検出・・・・・・検出部面積30×30umピンポイント測定に適しています。
- ・高いダイナミックレンジ・・・・・・数mT～数T高磁場領域までの高いリニアリティを実現。

従来の高周波磁場測定の問題点である誘導ノイズ起因の誤測定を大幅に改善したガウスメーターです。

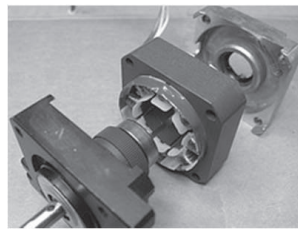
## 適用事例・測定のご提案



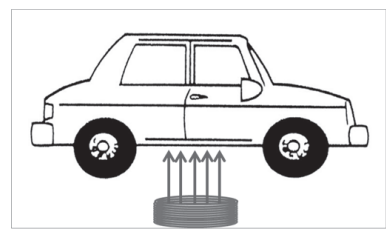
着磁パルス磁場



誘導加熱



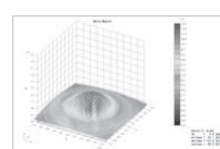
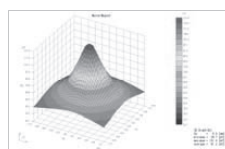
モーター、トランスの漏洩磁場



非接触給電

## 3次元磁場測定装置と受託測定のご提案

- ・理論計算と実測の一致を目指しています。・・・・センサと測定座標の整合性評価を行います。
- ・測定の再現性を重視しています。・・・・センサギャップ調整を自動化。
- ・専門的な見地で受託測定及びレポートを作成・・・・トレーサビリティに対応しています。



ガウスメーターメーカーだから出来る正確な磁界分布測定を一度お試しください。

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 本社: 〒158-0082  
 東京都世田谷区等々力6-13-10-602  
 TEL03-3705-7261 FAX 03-3705-7263  
 Email: ads@ad-s.co.jp  
 HP: http://www.ad-s.co.jp

システム製造・販売: 有限会社パワーテック  
 本社: 〒430-0802 静岡県浜松市東区将監町38-6  
 TEL053-463-8380 FAX 053-401-7881  
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## Technology Communication

Create solutions to fit the magnetic properties of industrial research and development.  
TOEI science industry is challenging type device manufacturer developing new technologies

# TOEIS

### Vibrating Sample Magnetometer (Personal VSM)

The most remarkable features of Personal VSM are compactness and low price while maintaining high performances equal to those of conventional VSM.

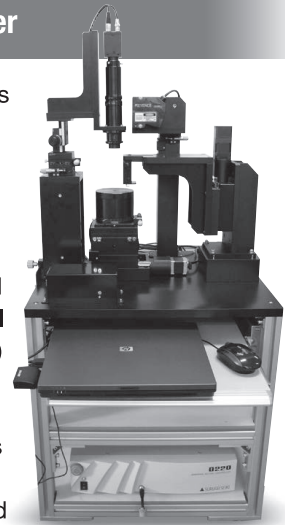
*The system allows remarkable reduction of floor space (approx.1/10) and weight (approx.1/6) comparison with other standard VSM*



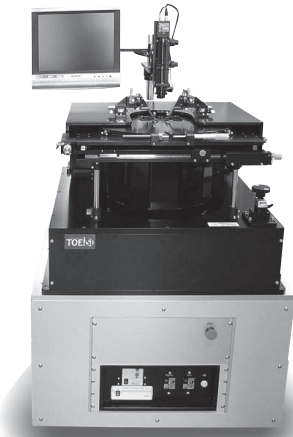
### 3D Magnetic Field Profiler

The main feature of the products is a combination of a high sensitivity field sensor and a multi-axis position control system.

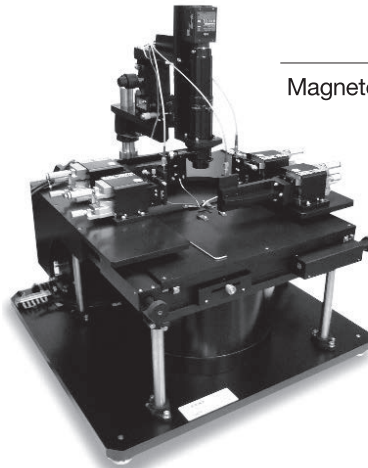
This allows high speed 3D measurements of magnetic field with a high magnetic and spatial resolution ( $\pm 0.5$  Oe and  $\pm 0.5\mu\text{m}$ ) The systems deal with the objects with a wide variety of dimensions and shapes such as permanent magnets, magnetic field sensors, electric motors and magnetic circuits.



### Omni-Directional Field Prober



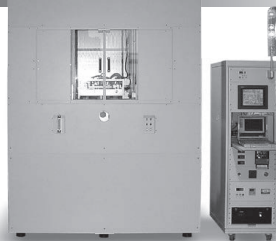
### Longitudinal and Perpendicular Magnetic Field Prober



#### Main Products

- Magnetoresistance measurement system
- TMR measurement system
- Non-magnetic autoprobe
- Non-magnetic semi-autoprobe
- Non-magnetic manual probe
- Non-magnetic RF probe
- Non-magnetic probe card

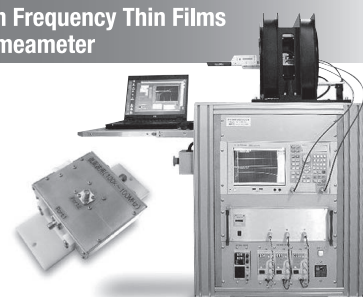
### Furnaces with Magnetic Field



### Magnetostriction Measurement System for Ultra-Thin Films



### High Frequency Thin Films Permeameter



### Low Residual Field Electromagnets

### Electromagnets

**Main Products:** Helmholtz coil, Solenoid coil, Weiss magnet, Double yoke magnet, Bitter magnet, Variable gap magnet, Coils for optical research and others.

# TOEIS

**Toei Scientific Industrial co., Ltd.**

Contact Us e-mail [gijutsu@toei-tc.co.jp](mailto:gijutsu@toei-tc.co.jp)

**Engineering Dept.** 1-101-60, Medeshimadai, Natori, 981-1251 Japan TEL:+81-22-382-6681, FAX:+81-22-382-6682

**Head Office** 8-29, 4-chome, Tomizawa, Taihaku-ku, Sendai, 982-0032 Japan TEL:+81-22-743-3221, FAX:+81-22-743-3235

**Utsunomiya Office** TEL:+81-28-610-7357

**Koriyama Office** TEL:+81-24-923-7331

**Iwaki Office** TEL:+81-246-21-0831

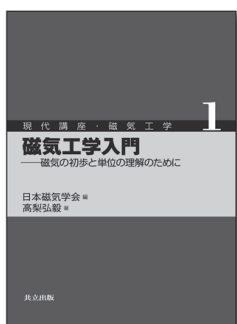
**Yamagata Office** TEL:+81-23-631-2761

**Morioka Office** TEL:+81-19-622-0365



現代講座・磁気工学

【各巻A5判・上製本】



1 **磁気工学入門** —磁気の初歩と単位の理解のために—  
 高梨弘毅著……………132頁・本体2,800円

2 **磁気工学の解析法**  
 三俣千春著……………240頁・本体3,400円

3 **スピントロニクス** —基礎編—  
 井上順一郎・伊藤博介著……………296頁・本体3,600円

4 **スピントロニクス** —応用編—  
 鈴木義茂・湯浅新治・久保田 均著……………続 刊

5 **パワーマグネティクスのための応用電磁気学**  
 早乙女英夫他著……………352頁・本体4,000円

本シリーズは、学部上級生から修士・若手技術者を主対象に、磁気工学における新機軸の研究対象と基礎的要素を結びつける教科書として企画・刊行。

マグネティクス・ライブラリー

【各巻A5判・上製本】



1 **磁気の付随現象とその応用**  
 井上光輝著……………続 刊

2 **磁性の電子論** 日本磁気学会『平成25年度出版賞』受賞  
 佐久間昭正著……………356頁・本体5,000円

3 **反強磁性体** —応用への展開—  
 深道和明著……………344頁・本体5,000円

4 **垂直磁気記録**  
 岩崎俊一・中村慶久・大内一弘・村岡裕明・青井 基著……………続 刊

本シリーズは磁気工学の基礎理論から最先端まで幅広い分野からテーマを集め、境界領域も含めて様々な研究分野に寄与する磁気の参考書として編纂。

マグネティクス・イントロダクション 全5巻 【各巻A5判・並製本】



1 **磁気工学超入門** —ようこそ、まぐねの国へ—  
 佐藤勝昭著……………168頁・本体2,500円

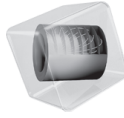
2 **メタマテリアル** —光と磁気の不思議な関係—  
 富田知志他著……………続 刊

3 **物質の中の磁気と光**  
 澤田 桂著……………続 刊

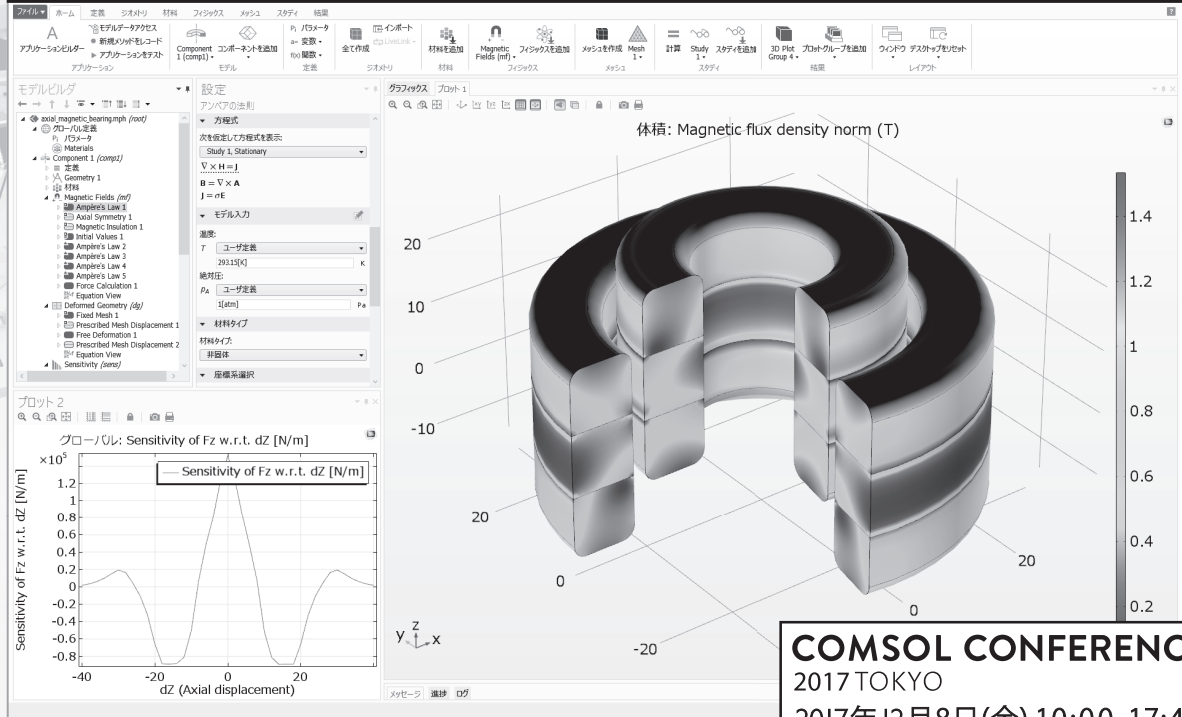
4 **環境保全に貢献する高磁場技術**  
 廣田憲之他著……………続 刊

5 **さまざまなところで活躍する磁気センサ**  
 藪上 信他著……………続 刊

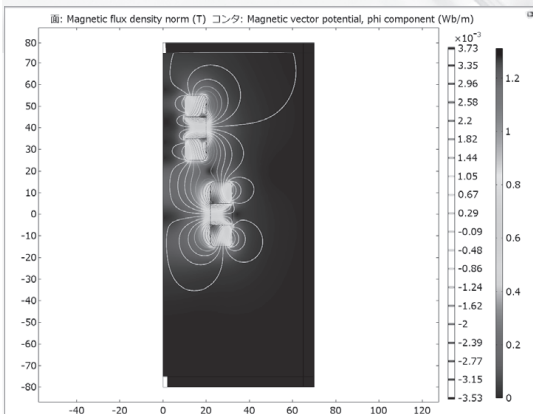
本シリーズは磁気の初学者とその周辺領域の読者を対象に、磁気の基礎の基礎から興味深い磁気現象や最先端の研究・技術まで、やさしく正確に解説。



### 永久磁石を利用した磁気軸受の解析例



**COMSOL CONFERENCE**  
2017 TOKYO  
2017年12月8日(金) 10:00-17:40  
秋葉原UDXビル4F (UDX Gallery/Next)  
<http://www.kesco.co.jp/conference/>



#### 永久磁石を使用した磁気軸受

永久磁石を使用した軸受はターボ機械、ポンプ、モータ、発電機やフライホイール式エネルギー貯蔵システムなど、様々な分野で使用されています。非接触かつ潤滑不要で保守整備を大幅に省略できる点は、従来の機械式ベアリングと比べて重要なメリットです。この例では、軸方向の永久磁石軸受の磁気力と剛性などの設計パラメータを計算する方法を示しています。

※AC/DCモジュールはCOMSOL Multiphysicsと併用するアドオン製品です。

#### AC/DC モジュールの適用例

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- バイオヒーティング
- コイルとソレノイド
- SPICE 回路とフィールドシミュレーション
- 接触抵抗
- 電磁両立性 (EMC) および電磁妨害 (EMI)
- 電磁力およびトルク
- 電磁力シールド
- 電気機械の変形
- ホール効果を利用したセンサ
- インシュレータ、コンデンサ、誘電体
- モータ、ジェネレータ、および他の電気機械
- 非線形材料
- 寄生容量とインダクタンス
- 永久磁石と電磁石
- 多孔質材料
- 抵抗および誘導加熱
- センサ
- 超伝導体
- 変圧器とインダクタ

**COMSOL Multiphysics® なら、今まで不可能だった 3 種以上のマルチフィジックス解析を強連成で実現できます。30 日間全機能無料トライアル、無料の導入セミナー、1000 種を超える世界の様々な事例をご提供いたします。詳しくは、下記の弊社営業部までお問い合わせください。**



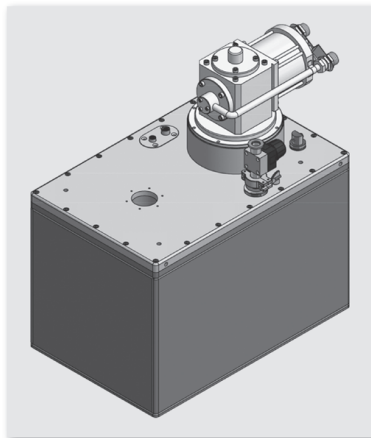
<http://www.comsol.jp>

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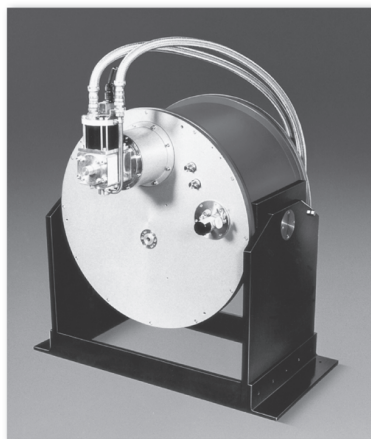
Tel : 03-5282-7040 ・ Fax : 03-5282-0808



## 新ミニ型テーブルトップ無冷媒マグネット

超小型無冷媒マグネットですので実験台に設置が出来ます。  
縦横の方向転換、水平移動も容易です。  
新マイクロ型のコンプレッサは空冷、単相AC100Vで使用できます。

磁場強度： 5T~7T  
室温ボア径： 52mm  
構成： 本体、空冷コンプレッサ、  
バイポーラマグネット電源



## 無冷媒マグネット

小型高性能な無冷媒マグネットです。

磁場強度： 5T~14T  
室温ボア径： 50mm~200mm  
磁場均一度： 0.1%@10mmdsv (高均一度型はオプション)  
マグネット： ソレノイド型、スプリットペア型  
構成： 本体、コンプレッサ、バイポーラマグネット電源、  
コンピュータコントロール



## 無冷媒サンプル冷却クライオスタット内蔵無冷媒マグネット

完全無冷媒でヘリウムガス中サンプルの冷却、温度コントロール  
及び超伝導マグネットの励磁が出来ます。

サンプル温度範囲： 1.6K~300K  
サンプル空間： 24mm、30mm、33mm径  
マグネット： ソレノイド5T~14T、  
又はスプリットペア5T~7T  
構成： 本体、コンプレッサ、バイポーラマグネット電源、  
コンピュータコントロールシステム

日本代理店 <http://www.naccjp.com> [nacc-c@naccjp.com](mailto:nacc-c@naccjp.com)



**日本オートマチックコントロール株式会社** 理科学システム部

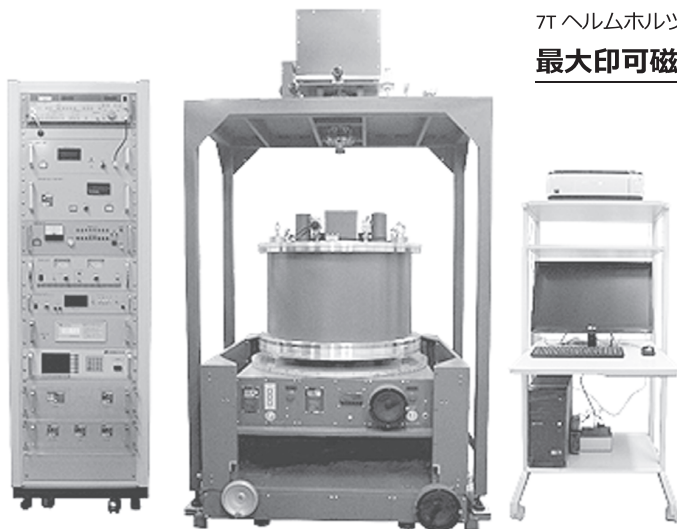
東京営業所 〒141-0032 東京都品川区大崎1-6-4  
TEL 03-5434-1600 FAX 03-5434-1630  
大阪 TEL(06)6541-3737 名古屋 TEL(052)252-7381 山口 TEL(0839)72-3764

ヘルムホルツコイル型 / ソレノイドコイル型

## 無冷媒超電導マグネット式高感度振動試料型磁力計

7T ヘルムホルツコイル型 VSM TM-VSM7050-SM 型

**最大印可磁界 7Tesla で磁化の高感度測定が可能**



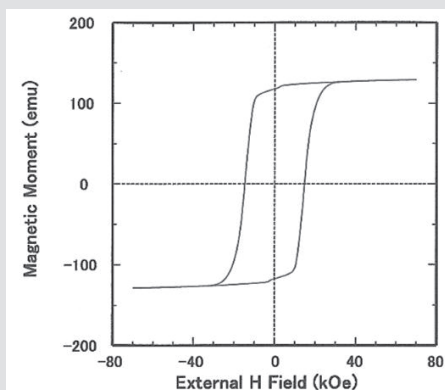
### ◆主な特徴

- ✓ ヘルムホルツコイル型のため磁界の均一性が良く、高感度の測定が可能です
- ✓ 超電導マグネットを回転させることにより、磁化の角度依存性が測定できます。また、磁気異方性トルク計と併用することが可能です

### サンプル測定お引き受けします！

このシステムを当社にデモ機として常設しています。初回 2 サンプル程度は無料で測定しますのでお気軽にご相談ください

— 5mm 角 NdFeB 測定例 —



7T ソレノイドコイル型 VSM にて測定



6Tesla ソレノイドコイル型 VSM

**6T フルループ測定 最速5分**

## 玉川製作所製 超電導マグネットシリーズ

### 【小型超電導マグネット】

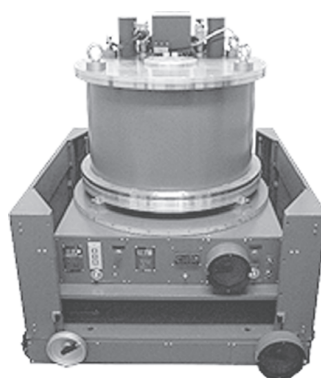


仕様例；  
発生磁界：5Tesla  
均一度：0.1% / 10mmDSV  
室温ポア径：φ50.8mm  
冷凍機：0.4W GM 冷凍機  
寸法：W280mmxD200mm  
          xH590mm  
重量：約 60kg

### 【ラインナップ】

- ◆ソレノイドコイル型 5~10Tesla
  - ◆ヘルムホルツコイル型 5~7Tesla
- ※特注承ります。ご相談ください

### 【10Tesla 超電導マグネット】



仕様例；  
発生磁界：10Tesla  
均一度：0.1% / 10mmDSV  
室温ポア径：φ70mm  
冷凍機：1.5W GM 冷凍機  
寸法：755mmφ  
          ×H480mm  
重量：約 500kg

- ◆当社の超電導マグネットは、VSM や磁気異方性トルク計ほか、さまざまなシステムに組み合わせ可能です

※写真は上下動台車付（オプション）

 **株式会社玉川製作所**

〒982-0014 宮城県仙台市太白区大野田三丁目 10-19

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★**安定品質** … LORD社は、20年以上前からMRに関する基礎研究と開発をおこなっており、MRに関する特許も数多く保有しています。



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