

PROGRAM

Sep. 6/Room A

Symposium "Novel design and synthesis approach for electro-magnetic materials"

Chief Organizer: S. Demura (Nihon Univ.)

9:00 ~ 10:30

Chair: S. Demura (Nihon Univ.)

06aA-1 Quantum Magnetism in Kamchatkan Copper Minerals (30min.)

°M. Fujihala (JAEA)

06aA-2 Discovery of Magnetocaloric Materials by Machine Learning (30min.)

°Y. Takano (NIMS)

06aA-3 Search for new superconductors using bulk combinatorial chemistry method (30min.)

°A. Iyo (AIST)

10:45 ~ 11:45

Chair: T. Katase (Tokyo Inst. Tech.)

06aA-4 Intercalation compounds of 1D-structured transition metal trichalcogenides (30min.)

°M. Fujioka (Hokkaido Univ.)

06aA-5 Layered ruthenium and iridium oxyfluoride thin films fabricated via topochemical fluorination (30min.)

°A. Chikamatsu¹, T. Hasegawa² (¹Ochanomizu Univ., ²Univ. of Tokyo)

Symposium "Basic lecture and front line on motor and power electronics field and an expectation on material science"

Chief Organizer: S. Motozuka (Kyushu Inst. Tech.)

13:30 ~ 14:30

Chair: T. Takura (Tohoku Inst. Tech.)

06pA-1 Expectation to Magnetic of Electrical Motor, Power Electronics in Electrical Vehicle (60min.)

°K. Fujisaki (Toyota Tech. Inst.)

14:45 ~ 16:45

Chair: S. Motozuka (Kyushu Inst. Tech.)

06pA-2 Magnetic domain structure and magnetic properties of soft magnetic materials (30min.)

°M. Takezawa (Kyushu Inst. Tech.)

06pA-3 Basics of Power Electronics (30min. online or video lecture)

°N. Hoshi (Tokyo Univ. Sci.)

06pA-4 Magnetic properties expected of soft magnetic materials by motor designers (30min.)

°M. Hazeyama (MITSUBISHI)

06pA-5 Recent trend in soft magnetic material for power electronics (30min.)

°I. Nakahata, K. Mori, H. Matsumoto (TDK)

Sep. 6/Room B

High frequency/Granular

9:00 ~ 10:15

Chair: T. Kato (Nagoya Univ.)

06aB-1 Faraday effect of CoFe₂O₄-fluoride nanogranular films

°N. Kobayashi, T. Iwasa, K. Ikeda, K. Arai (DENJIKEN)

06aB-2 Fabrication of isotropic Co-MgF₂ granular films and their magneto-optical properties.

°M. Miyamoto¹, T. Kubo¹, S. Sue^{1,2}, M. Sonehara², T. Sato² (¹CITIZEN FINEDEVICE, ²Shinshu Univ.)

06aB-3 AC magnetic susceptibility of superparamagnetic Co-Pt nanoparticles synthesized in *Pyrococcus furiosus* virus-like particle crystal

°K. Tagata¹, D. Kanda¹, N. Kobayashi¹, S. Ichikawa¹, N. Kishida¹, A. Higashiura², R. Nakatani¹, A. Nakagawa¹, Y. Shiratsuchi¹ (¹Osaka Univ., ²Hiroshima Univ.)

- 06aB-4 Study on High-frequency Magnetic Properties of Amorphous Fe-B Chain Particles
K. Murata, T. Miyazaki, H. Aoki, H. Masumoto, °Y. Endo (Tohoku Univ.)
- 06aB-5 Thickness Dependence of High-frequency Magnetic Properties for Fe-Ga-C films with Fine Crystalline
T. Muramatsu, T. Miyazaki, °Y. Endo (Tohoku Univ.)

Skymion **10:30 ~ 11:30** Chair: J. Ohe (Toho Univ.)

- 06aB-6 Evaluation of transfer entropy and its relaxation time for skymions
°H. Mori¹, M. Goto^{1,2}, R. Ishikawa³, S. Miki¹, H. Nomura^{1,2}, Y. Suzuki^{1,2} (¹Osaka Univ., ²CSRN-Osaka, ³ULVAC Inc.)
- 06aB-7 Control of distribution and motion of skymions by sloped electric field
°R. Ishikawa¹, M. Goto^{2,3}, H. Nomura^{2,3}, Y. Suzuki^{2,3} (¹ULVAC Inc., ²Osaka Univ., ³CSRN-Osaka)
- 06aB-8 Micromagnetic simulation of the conservative-join circuit operated by the Brownian motion of skymions
°S. Miki^{1,2}, R. Ishikawa³, E. Tamura^{1,2}, H. Nomura^{1,2}, M. Goto^{1,2}, Y. Suzuki^{1,2} (¹Osaka Univ., ²CSRN-Osaka, ³ULVAC, Inc.)
- 06aB-9 Withdrawn

Magnetism control/Dynamics **13:30 ~ 15:15** Chair: M. Goto (Osaka Univ.)

- 06pB-1 Voltage control of magnetic interlayer coupling using insulating ferromagnets
°A. Hidaka, H. Yanagihara (Univ. of Tsukuba)
- 06pB-2 Fabrication of Fe/NiO(001) thin films for voltage-controlled magnetic anisotropy measurements.
°J. Shimayama, A. Hidaka, H. Yanagihara (Univ. of Tsukuba)
- 06pB-3 Modulation of magnetic properties of CoPd alloy thin films by hydrogen absorption
°Y. Kono¹, T. Kojima², T. Miyamachi¹, M. Mizuguchi¹ (¹Nagoya Univ., ²Shinshu Univ.)
- 06pB-4 Effect of annealing on magnetic anisotropy and damping constant of MgO/CoFe/Pt trilayer films
°Y. Konishi, T. Kato, D. Oshima (Nagoya Univ.)
- 06pB-5 Magnetization dynamics of FeCo/Cu/GdFeCo trilayers triggered by ultrashort pulse laser
K. Seguchi, D. Oshima, °T. Kato (Nagoya Univ.)
- 06pB-6 Temperature dependence of magnetization dynamics in $L1_0$ -FePt thin film
°Y. Sasaki¹, I. Suzuki¹, R. Mandal^{1,2}, S. Kasai¹, Y. Takahashi¹ (¹NIMS, ²WPI-AIMR)
- 06pB-7 Nonreciprocal propagation of surface acoustic waves in a tri-layer synthetic antiferromagnet
°H. Matsumoto, T. Kawada, M. Ishibashi, M. Kawaguchi, M. Hayashi (Univ. of Tokyo)

Nanoparticle • Thin film **15:30 ~ 17:00** Chair: S. Isogami (NIMS)

- 06pB-8 Crystal structure and magnetic properties of FeCo nitrides prepared by ammonia gas nitridation
°C. Kodaka, M. Kishimoto, E. Kita, H. Yanagihara (Univ. of Tsukuba)
- 06pB-9 Synthesis of Fe-based magnetic alloy materials using topotactic reaction
°T. Hiramatsu¹, M. Kishimoto², H. Yanagihara², T. Miyamachi¹, M. Mizuguchi¹ (¹Nagoya Univ., ²Univ. of Tsukuba)
- 06pB-10 Growth and electronic structures of organic magnetic-metal nanoclusters prepared on metal surfaces
R. Nemoto¹, P. Krueger¹, F. Nishino¹, C. Wang², M. Horie², T. Hosokai³, Y. Hasegawa⁴, S. Kera⁴, °T. Yamada¹
(¹Chiba Univ., ²Tsing Hua Univ., ³AIST, ⁴IMS)
- 06pB-11 High rate RF sputtering for MgO thin film by hot cathode method with porous target
°D. Miyazaki¹, Y. Hirokawa¹, J. Seong-Jae¹, A. Shimizu¹, K. Iwatani², S. Hinata¹, T. Ogawa¹, S. Saito¹
(¹Tohoku Univ., ²Toshima Manufacturing Co.)
- 06pB-12 Influences of N Atom Addition on the Structural, Magnetic, and Magnetostrictive Properties of Fe-Al Alloy Thin Film
°T. Sato¹, K. Imamura¹, Y. Maeda¹, M. Ohtake¹, T. Kawai¹, M. Futamoto¹, F. Kirino², N. Inaba³
(¹Yokohama National Univ., ²Tokyo Univ. of Arts, ³Yamagata Univ.)
- 06pB-13 β -Mn type CoZnMn thin film epitaxially grown on single crystal substrate
°D. Oshima, R. Mitsuhashi, N. Ikarashi, T. Kato, M. Nagao (Nagoya Univ.)

Sep. 6/Room C

Magnetostriction/Vibration power generation **9:00 ~ 10:30** Chair: M. Ohta (Hitachi Metal/Shimane Univ.)

- 06aC-1 Effect of the Vibration of Cantilever Beam on the Vibration Power Generation
°T. Kawai, E. Ishikawa, M. Ohtake, M. Futamoto (Yokohama National Univ.)

- 06aC-2 Influences of Bias Magnetic Field on the Magnetization Behavior and the Output Voltage in Magnetostrictive Vibration Power Generation
 °E. Ishikawa, T. Kawai, M. Ohtake, M. Futamoto (Yokohama National Univ.)
- 06aC-3 Design of Magnetic Cross-Sectional Structure of Cantilever Beam for Improvement of Power Density in Magnetostrictive Vibration Power Generation
 °E. Ishikawa, T. Kawai, M. Ohtake, M. Futamoto (Yokohama National Univ.)
- 06aC-4 Magnetostrictive Vibration Power Generation by Using Electroplated Fe-Co Thick Film
 °S. Aketa, E. Ishikawa, Y. Nakamura, M. Ohtake, T. Kawai, M. Futamoto (Yokohama National Univ.)
- 06aC-5 Effect of device size on vibration property of grain-oriented electrical steel
 °T. Okada¹, S. Fujieda¹, S. Suzuki², S. Seino¹, T. Nakagawa¹ (¹Osaka Univ., ²Tohoku Univ.)
- 06aC-6 Relation between magnetostrictive properties and crystal structure of $\text{Cu}_x\text{Co}_{1-x}\text{Fe}_2\text{O}_4$
 °S. Fujieda, M. Hisamatsu, S. Kosugi, S. Seino, T. Nakagawa (Osaka Univ.)

Filmes (Magnetostriction/Magnetic Physics) 10:45 ~ 12:15 Chair: S. Fujieda (Osaka Univ.)

- 06aC-7 Preparation and magnetostriction of Fe-Ga epitaxial thin films
 °H. Ding, T. Seki, Y. Endo, K. Takanashi (Tohoku Univ.)
- 06aC-8 Structural and Magnetostrictive Properties of Epitaxial γ' - Fe_4N Thin Films with Different Orientations
 °K. Abe¹, Y. Nakamura¹, K. Imamura¹, Y. Maeda¹, M. Ohtake¹, T. Kawai¹, M. Futamoto¹, S. Isogami², F. Kirino³, N. Inaba⁴
 (¹Yokohama National Univ., ²NIMS, ³Tokyo Univ. of Arts, ⁴Yamagata Univ.)
- 06aC-9 Structural, Magnetic, and Magnetostrictive Properties of $(\text{Fe}_{0.7}\text{Co}_{0.3})_{95}\text{Al}_5$ Alloy Single-Crystal Thin Films
 °Y. Nakamura¹, M. Ohtake¹, T. Kawai¹, M. Futamoto¹, F. Kirino², N. Inaba³
 (¹Yokohama National Univ., ²Tokyo Univ. of Arts, ³Yamagata Univ.)
- 06aC-10 Temperature dependence of anomalous Hall effect in GdFe thin films with different composition ratios
 °Y. Sou, Y. Kasatani, H. Yoshikawa, A. Tsukamoto (Nihon Univ.)
- 06aC-11 Magneto-electric effect of $\text{CoFe}_2\text{O}_4/\text{LiNbO}_3$ laminated films prepared by metal organic decomposition
 °K. Yoneyama, K. Kamishima, K. Kakizaki (Saitama Univ.)
- 06aC-12 Topological Quantum Properties of Magnetic Skyrmions in Filled β -Mn-type Chiral Magnet
 °B. Qiang¹, T. Fukasawa¹, T. Hajiri¹, M. Togashi¹, M. Kuwahara¹, T. Ito¹, H. Asano^{1,2} (¹Nagoya Univ., ²NISRI)

Filmes (Magneto-optic) 13:30 ~ 15:15 Chair: F. Kirino (Tokyo Univ. of Arts)

- 06pC-1 Effect of Lanthanoids substitution against Bi on various magnetic properties of multiferroic $(\text{Bi},L)(\text{Fe},\text{Co})\text{O}_3$ (L : Lanthanoids) thin films
 S. Ratha, R. Suzuki, Y. Suzuki, K. Takeda, D. Yamamoto, G. Egawa, °S. Yoshimura (Akita Univ.)
- 06pC-2 Effect of laser-assisted heating / annealing on various magnetic properties of multiferroic BiFeO_3 -based thin films
 °R. Suzuki, G. Egawa, S. Yoshimura (Akita Univ.)
- 06pC-3 Perpendicular magnetic anisotropy of an interface of Fe/NiO investigated by polar magneto-optic Kerr effect
 °S. Jung, A. Hidaka, H. Yanagihara (Univ. of Tsukuba)
- 06pC-4 Magnetization process of Co/Ru/Co Synthetic Ferrimagnets
 °Y. Hisada, S. Komori, K. Imura, T. Taniyama (Nagoya Univ.)
- 06pC-5 Magneto-optical hysteresis analysis in FeCo-SiN nanogranular films
 °K. Ikeda, N. Kobayashi, K. Arai (DENJIKEN)
- 06pC-6 Optical and magneto-optical properties of Co-SiO₂ granular thin films
 °Y. Funaki¹, A. Kitahara¹, R. Hashimoto², H. Uchida¹ (¹Toyohashi Univ. Tech., ²NIT, Suzuka Coll.)
- 06pC-7 Magneto-optical surface plasmons on CoPt/Ru stacked films with antiferromagnetic coupling
 °H. Yamane¹, M. Kobayashi², Y. Yasukawa² (¹AIT, ²Chiba Inst. Tech.)

High-frequency/Magnetic resonance 15:30 ~ 16:45 Chair: K. Kamishima (Saitama Univ.)

- 06pC-8 Microwave Frequency Conversion Using Time-Varying Permeability Metamaterials
 °T. Kodama¹, H. Kurosawa², S. Ohno¹, N. Kikuchi¹, M. Hatayama¹, S. Okamoto¹, S. Tomita¹
 (¹Tohoku Univ., ²Kyoto Inst. of Tech.)

- 06pC-9 High-frequency electromagnetic wave absorption in micropatterned magnetic disk array
 °M. Peng¹, T. Onuma¹, M. Hatayama¹, N. Kikuchi¹, S. Tamaru², S. Okamoto¹ (¹Tohoku Univ., ²AIST)
- 06pC-10 Study of quantitative evaluation methods for anisotropic magnetic field in magnetic particles
 °H. Kubota, M. Kishimoto, H. Yanagihara (Univ. of Tsukuba)
- 06pC-11 Quantitative analysis of cation defects in Co ferrites studied by XMCD
 °J. Okabayashi¹, M. A. Tanaka², M. Morishita², H. Yanagihara³, K. Mibu²
 (¹Univ. of Tokyo, ²Nagoya Inst. Tech., ³Univ. of Tsukuba)
- 06pC-12 Characterization of EuBi₂Fe_{5-x}Ga_xO₁₂ thin films by Ferromagnetic Resonance Measurements
 °W. Asano¹, T. Nishi², D. Oshima³, T. Kato³, K. Lee⁴, M. Kawahara⁵, M. Nisikawa¹, T. Ishibashi¹
 (¹Nagaoka Univ. Tech., ²Kobe City Coll. Tech., ³Nagoya Univ., ⁴Sogang Univ., ⁵Kojuendo)

Sep. 6/Room D

Magnetic imaging (Optical/Electron microscope) 9:00 ~ 10:15 Chair: T. Yoshida (Kyushu Univ.)

- 06aD-1 Observation of transverse domains in grain-oriented electrical steel by means of X-ray magnetic circularly polarized emission microscopy
 °T. Inami¹, K. Sugawara¹, T. Nakada², Y. Sakaguchi², S. Takahashi² (¹QST, ²JFE-TEC)
- 06aD-2 Kerr Effect Microscope using Femtosecond Laser Pulses of Optical Frequency Comb
 °S. Meguro¹, S. Saito² (¹NEOARK, ²Tohoku Univ.)
- 06aD-3 Magnetic domain observation of grain-oriented electrical steel with insulation coating using magneto-optical imaging plate
 °H. Sakaguchi¹, S. Meguro², H. Saito³, T. Ishibashi¹ (¹Nagaoka Univ. Tech., ²NEOARK, ³Akita Univ.)
- 06aD-4 Direct measurement of magnetic domain wall width by DPC-STEM
 °Y. O. Murakami¹, T. Seki^{1,2}, A. Kinoshita³, T. Shoji³, Y. Ikuhara^{1,4}, N. Shibata^{1,4}
 (¹Univ. of Tokyo, ²JST-PREST, ³TOYOTA Motor, ⁴JFCC)
- 06aD-5 Application of compressed sensing to high throughput magnetic domain imaging by spin-SEM
 °Y. Imai¹, T. Kohashi¹, M. Kobayashi¹, S. Yabu², J. Katane² (¹Hitachi, ²Hitachi High-Tec)

Magnetic imaging (Magnetic force microscope) 10:30 ~ 11:30 Chair: T. Ishibashi (Nagaoka Univ. Tech.)

- 06aD-6 Wideband high-frequency magnetic field imaging of perpendicular magnetic recording head by alternating magnetic force microscopy with superparamagnetic tip
 °K. Suzuki, M. Makarova, H. Sonobe, T. Matsumura, H. Saito (Akita Univ.)
- 06aD-7 Development of microwave radiation system for high frequency magnetic field imaging by using alternating magnetic force microscopy
 °N. Umeda, M. Makarova, H. Sonobe, T. Matsumura, H. Saito (Akita Univ.)
- 06aD-8 Quantitative magnetic field imaging by using alternating magnetic force microscopy with superparamagnetic tip
 °R. Ehara, K. Miura, T. Matsumura, H. Saito (Akita Univ.)
- 06aD-9 Application of superparamagnetic tip to advanced magnetic imaging on alternating magnetic force microscopy
 °H. Saito (Akita Univ.)

High frequency magnetic sensor I 13:15 ~ 14:15 Chair: H. Kikuchi (Iwate Univ.)

- 06pD-1 Development of coreless current sensor using coil on printed circuit board
 °S. Kuribara¹, H. Yamauchi¹, K. Koizumi¹, S. Harayama² (¹Fuji Electric, ²Fuji Electric Meter)
- 06pD-2 Investigation of magnetic yoke with embedded sensor head for optical probe current sensor with high sensitivity
 °T. Murakami¹, M. Sonehara¹, T. Sato¹, S. Sue^{1,2}, T. Kubo², M. Miyamoto² (¹Shinshu Univ., ²CITIZEN FINEDEVICE)
- 06pD-3 Application of High Sensitive AC Field Modulation GMR Sensor to a Magnetic Field Microscope and its Spatial Resolution
 °A. Kikitsu¹, Y. Higashi¹, Y. Kurosaki¹, S. Shirotori¹, T. Ngatsuka², K. Suzuki², Y. Terui² (¹Toshiba, ²Toshiba Nanoanalysis)
- 06pD-4 Evaluation of Permeability using Microstrip Line slitted Probe
 °S. Yabukami, Y. Watanabe, A. Mashiko, M. Sakamoto, K. Okita (Tohoku Univ.)

- High frequency magnetic sensor II** **14:30 ~ 15:30** Chair: S. Yabukami (Tohoku Univ.)
- 06pD-5 Improvement of Electromagnetic Properties in GHz Frequency of Ferrite Thin Film Integrated RF Inductor
°T. Nakano, S. Miyazaki, Y. Ozaki, K. Koike, D. Inokuchi (TDK)
- 06pD-6 Proposal of a High Frequency Near Magnetic Field Measurement Method Applicable to Actual Circuits in Electronic Devices
°T. Karita^{1,2}, R. Ishida^{1,2}, T. Goto¹, K. Ishiyama¹ (¹RIEC Tohoku Univ., ²Graduate School of Engineering, Tohoku Univ.)
- 06pD-7 Study on Driving MI Sensor Using Low Frequency Wiegand Pulse
°R. Yao^{1,2}, Y. Takemura², T. Uchiyama¹ (¹Nagoya Univ., ²Yokohama National Univ.)
- 06pD-8 Natural Vibration Measurement of Steel Plates by TMR Sensor for Nondestructive Testing Application
°J. Ito, Z. Jin, M. Oogane (Tohoku Univ.)

- Thin film sensor** **15:45 ~ 17:00** Chair: T. Sato (Shinshu Univ.)
- 06pD-9 Investigation of output signal in symmetric response GMR under AC modulation
°Y. Higashi, A. Kikitsu, Y. Kurosaki, S. Shirotori (Toshiba)
- 06pD-10 Fabrication of feedback-type GMR sensors using antiphase magnetization modulation
°K. Komuro, D. Oshima, T. Kato (Nagoya Univ.)
- 06pD-11 Analysis of strain sensor operation by local anisotropy measurement
°K. Toyoda, T. Goto, K. Ishiyama (Tohoku Univ.)
- 06pD-12 Magnetic anisotropy control using permanent magnets and applying direct current
A. Ueno, M. Tanii, °H. Kikuchi (Iwate Univ.)
- 06pD-13 Considerations on Appropriate Slit Width of Line Type Thin Film Magnetic Field Sensor
°M. Sakamoto, R. Suzuki, T. Ishihara, J. Honda, S. Yabukami (Tohoku Univ.)

Sep. 7/Room A

Symposium "Recent progress and future prospects for nuclear magnetic resonance technique under low magnetic field"

Chief Organizer: M. Oogane (Tohoku Univ.)

- 9:00 ~ 10:00** Chair: M. Oogane (Tohoku Univ.)
- 07aA-1 Advances in Magnetic Resonance Imaging: From Low-Field to High-Field and Back to Low-Field MRI (30min.)
°Y. Terada (Univ. of Tsukuba)
- 07aA-2 Measurement of Magnetic Resonance Signal without Prepolarization Technique at 1 mT (30min.)
°D. Oyama (Kanazawa Inst. Tech.)
- 10:15 ~ 11:45** Chair: M. Oogane (Tohoku Univ.)
- 07aA-3 Ultra-low field MRI with an optically pumped magnetometer (30min.)
°T. Oida¹, S. Hori², T. Moriya¹, A. Saito¹, M. Suyama¹, T. Kobayashi² (¹Hamamatsu Photonics, ²Kyoto Univ.)
- 07aA-4 Nano-NMR technique based on NV center in diamond (30min.)
°S. Onoda¹, J. Isoya² (¹QST, ²Univ. of Tsukuba)
- 07aA-5 Development of compact proton magnetometer using TMR sensor (30min.)
°K. Fujiwara, H. Wagatsuma, S. Kumagai (Spin Sensing Factory Corp.)

Sep. 7/Room B

- Thermoelectric effect** **9:00 ~ 10:15** Chair: Y. Kurokawa (Kyushu Univ.)
- 07aB-1 Enhancement of transverse Seebeck coefficient in semiconductor/ferromagnetic metal multilayer by introducing interface and controlling periodic thickness
°R. Kiitaura¹, T. Ishibe¹, M. Mizuguchi², Y. Nakamura¹ (¹Osaka Univ., ²Nagoya Univ.)
- 07aB-2 Quantitative analysis of dynamical thermal spin injection induced by FMR heating effect
°S. Obinata, R. Iimori, K. Ohnishi, T. Kimura (Kyushu Univ.)
- 07aB-3 The effect of Anomalous Hall resistivity on Anomalous Nernst coefficient in amorphous GdFe ferrimagnetic thin film
°Y. Kobayashi, Y. Kasatani, H. Yoshikawa, A. Tsukamoto (Nihon Univ.)

- 07aB-4 Modulation of the anomalous Nernst effect in nitride films on SrTiO₃ substrates
 °K. Ito¹, H. Sharma^{1,2}, M. Mizuguchi^{1,2,3}, K. Takanashi^{1,4} (¹Tohoku Univ., ²Nagoya Univ., ³CSRN, Osaka Univ., ⁴JAEA)
- 07aB-5 Characterization of the anomalous Nernst effect in Fe_{4-x}Ni_xN films
 °W. Yin¹, K. Ito¹, Y. Tsubowa¹, M. Tsujikawa¹, M. Shirai¹, K. Takanashi^{1,2} (¹Tohoku Univ., ²JAEA)

Spin injection **10:30 ~ 11:30** Chair: M. Tsujikawa (Tohoku Univ.)

- 07aB-6 Pressure effects on dynamical spin injection at ferromagnet/heavy metal interface
 °R. Iimori, S. Obinata, A. Mitsuda, T. Kimura (Kyushu Univ.)
- 07aB-7 Frequency-dependent Artifact in ST-FMR Measurements
 °T. Horaguchi¹, K. Yamanoi¹, M. Matsu², Y. Nozaki^{1,3} (¹Keio Univ., ²Kavli-ITS UCAS, ³CSRN Keio Univ.)
- 07aB-8 Sputtering condition dependence of spin-torque efficiency in Ti/W composition graded material
 °H. Nakayama¹, T. Horaguchi¹, T. Scheike¹, K. Yamanoi¹, Y. Nozaki^{1,2} (¹Keio Univ., ²CSRN, Keio Univ.)
- 07aB-9 Optical measurement of thermo-spin effects through antiferromagnetic insulator NiO
 °T. Yamazaki, T. Seki, T. Kubota, K. Takanashi (Tohoku Univ.)

Sep. 7/Room C

Modeling **9:00 ~ 10:15** Chair: K. Masuda (NIMS)

- 07aC-1 Computer Simulation of Bias-free SOT-MRAM with DMI
 °J. Watanabe, Y. Nakatani (UEC)
- 07aC-2 Withdrawn
- 07aC-3 Mechanism of magnetization reversal and structural design of nanomagnet using extended Landau Free Energy Model
 S. Kunii, K. Masuzawa, A. Foggiatto, C. Mitsumata, °M. Kotsugi (Tokyo Univ. Sci.)
- 07aC-4 Design of the extended Landau free energy model for causal analysis of magnetization reversal phenomenon
 °K. Masuzawa, A. L. Foggiatto, C. Mitsumata, M. Kotsugi (Tokyo Univ. Sci.)
- 07aC-5 Interpretation of Coercivity and Energy Mechanism based on the Extended Energy Landscape Model
 °A. Lira Foggiatto¹, S. Kunii¹, C. Mitsumata^{1,2}, M. Kotsugi¹ (¹Tokyo Univ. Sci., ²NIMS)

Compounds **10:30 ~ 12:00** Chair: T. Kawai (Yokohama National Univ.)

- 07aC-6 High-pressure synthesis and magnetic properties of Cr-Ge Chimney-Ladder phase
 T. Sasaki, K. Noda, N. A. Gaida, K. Niwa, °M. Hasegawa (Nagoya Univ.)
- 07aC-7 Synthesis of Fe²⁺/Ti⁴⁺ substituted Ba₁₂Fe₂₈Ti₁₅O₈₄
 °H. Onuma, K. Kakizaki, K. Kamishima (Saitama Univ.)
- 07aC-8 Searching for conditions to synthesize Ca-Ba W-type hexagonal ferrites
 °Y. Matsui, K. Kakizaki, K. Kamishima (Saitama Univ.)
- 07aC-9 Mossbauer spectroscopy measurements of EuSn₂P₂
 °T. Shimura¹, S. Liu¹, M. Matoba¹, Y. Kamihara¹, S. Kitao², M. Seto² (¹Keio Univ., ²Kyoto Univ.)
- 07aC-10 Synthesis of divalent cation substituted Ba₂Sn_{2+x}Me_{1+x}Fe_{12-2x}O₂₂
 °H. Harasawa, K. Kamishima, K. Kakizaki (Saitama Univ.)
- 07aC-11 Synthesis and Transport Properties of SnPn layered compound EuSn₂P₂
 °Z. Liu, T. Shimura, M. Matoba, Y. Kamihara (Keio Univ.)

Sep. 7/Room D

Manganese nitride **9:00 ~ 10:15** Chair: H. Yanagihara (Tsukuba Univ.)

- 07aD-1 Epitaxial Growth of Mn-N Thin Films on MgO(001) Single-Crystal Substrates
 °R. Kuwayama¹, K. Imamura¹, M. Ohtake¹, S. Isogami², T. Kawai¹, M. Futamoto¹, F. Kirino³, N. Inaba⁴
 (¹Yokohama National Univ., ²NIMS, ³Tokyo Univ. of Arts, ⁴Yamagata Univ.)
- 07aD-2 Co-relationship between current-driven magnetization switching and magnetic anisotropy in a 111-oriented Mn₄N magnetic single layer
 °S. Isogami, R. Nagalingham, Y. Kozuka, Y. Takahashi (NIMS)
- 07aD-3 Tailored non-collinear magnetic structures of Mn₄N thin films by light elements
 °S. Isogami¹, M. Ohtake², Y. Takahashi¹ (¹NIMS, ²Yokohama National Univ.)

- 07aD-4 Possibility of N Site Replacement with B Atom in Mn₄N Single-Crystal Thin Film
 °K. Imamura¹, Y. Nakamura¹, S. Noro¹, S. Isogami², M. Ohtake¹ (¹Yokohama National Univ., ²NIMS)
- 07aD-5 Preparation of (001)-Oriented Mn₄N Poly-Crystalline Thin Film with Perpendicular Magnetic Anisotropy
 °Y. Nakamura¹, K. Imamura¹, S. Noro¹, S. Isogami², M. Ohtake¹ (¹Yokohama National Univ., ²NIMS)

Magnetic simulation

10:30 ~ 11:30

Chair: K. Yamada (Gifu Univ.)

- 07aD-6 Frustrated magnetic skyrmions: from two dimensions to three dimensions
 °X. Zhang¹, J. Xia¹, O. A. Tretiakov², H. T. Diep³, J. Yang⁴, G. Zhao⁵, M. Ezawa⁶, Y. Zhou⁷, X. Liu¹
 (¹Shinshu Univ., ²UNSW Sydney, ³CY Cergy Paris Univ., ⁴Peking Univ., ⁵Sichuan Normal Univ., ⁶Univ. of Tokyo, ⁷CUHKSZ)
- 07aD-7 Numerical study on the helical magnetic structure in frustrate magnets
 °J. Kaneta, J. Ohe (Toho Univ.)
- 07aD-8 Topological charge control of structure in frustrated magnets
 °M. Miyata¹, G. Tataru², J. Ohe¹ (¹Toho Univ., ²RIKEN)
- 07aD-9 Asymmetric cellular-automaton for straintronics
 °T. Wakabayashi¹, M. Goto^{1,2}, Y. Suzuki^{1,2}, H. Nomura^{1,2} (¹Osaka Univ., ²CSRN-Osaka)

Sep. 7/SASTec, E1 3F

Fellow lecture

13:30 ~ 15:00

Chair: T. Kondo (KIOXIA)

- 07FL-1 Fundamental Research for Magneto-Optical Recording and Combined Application System of Magnetics and Optics
 °K. Nakagawa (Nihon Univ.)
- 07FL-2 Study on spin-related properties in magnetic nanostructures
 °T. Ono (Kyoto Univ.)
- 07FL-3 Microstructure control for magnetic thin films with high functionality
 °Y. K. Takahashi (NIMS)

Sep. 7/Poster Room

Poster session

10:00 ~ 12:00

Chair: T. Nakatani (NIMS)

- 07aPS-1 Preparation of Si/glass film/Nd-Fe-B film applied to MEMS
 °K. Higuchi, I. Hukuda, A. Yamashita, T. Yanai, M. Nakano, H. Fukunaga (Nagasaki Univ.)
- 07aPS-2 Study of detection coil of magnetic field generator for magnetic particle imaging
 °A. Furukawa, S. Seino, T. Nakagawa (Osaka Univ.)
- 07aPS-3 Effect of partial substitution of Zn for Cu on magnetostrictive properties of Cu_{0.5}Co_{0.5}Fe₂O₄
 °K. Fujiwara, S. Kosugi, S. Fujieda, S. Seino, T. Nakagawa (Osaka Univ.)
- 07aPS-4 Pulse-width dependence of spin-orbit torque switching in D₀₁₉-Mn₃Sn/Pt thin films
 °Y. Kobayashi¹, Y. Shiota¹, H. Narita¹, T. Ono¹, T. Moriyama^{1,2} (¹Kyoto Univ., ²JST-PREST)
- 07aPS-5 Dependence of magnetic properties on Ga composition for fcc - Fe₂MnGa_x alloys
 °Y. Sasaki, T. Shima, M. Doi (Tohoku Gakuin Univ.)
- 07aPS-6 Dependence of magnetic properties on Fe composition and thickness for L₂₁-Fe_xMnGa thin films
 °R. Mineta, S. Watanabe, T. Shima, M. Doi (Tohoku Gakuin Univ.)
- 07aPS-7 Development of the giant magnetostrictive actuator with ANC system for the ultra-compact EV (A consideration on thrust force characteristics including road noise range)
 °T. Kato¹, T. Kitamura², F. Maehara², D. Uchino², K. Ogawa², K. Ikeda³, A. Endo⁴, H. Kato², T. Narita², M. Furui¹
 (¹TUT, ²Tokai Univ., ³HUS, ⁴FIT)
- 07aPS-8 Magnetic Properties of Fe-Ga-M Thin Film and Effect of Annealing Temperature
 °K. Suzuki¹, Y. Fujiwara¹, D. Oshima², T. Kato², M. Jimbo³ (¹Mie Univ., ²Nagoya Univ., ³Daido Univ.)
- 07aPS-9 Direct Observation of magnetization distribution for concave Fe₃O₄ nanoparticles by electron holography
 °C. Noda¹, S. Kobayashi¹, K. Ono¹, S. Matsuo¹, Z. Akase², H. Kasai³ (¹Iwate Univ., ²IMRAM Tohoku Univ., ³Hitachi)
- 07aPS-10 Control of magnetic moment of FeSiBNb film by strain
 °Y. Kutsuna¹, Y. Fujiwara¹, D. Oshima², T. Kato², M. Jimbo³ (¹Mie Univ., ²Nagoya Univ., ³Daido Univ.)

- 07aPS-11 Development of rare-earth thick-film magnets applied to ultra-small stepping motors
 °K. Kouno, A. Yamashita, T. Yanai, M. Nakano, H. Fukunaga (Nagasaki Univ.)
- 07aPS-12 Effect of N₂ gas addition of sputtered FePt-BN granular films on nanostructure and magnetic properties
 °K. Tham¹, T. Saito², R. Kushibiki¹, S. Saito² (¹TANAKA, ²Tohoku Univ.)
- 07aPS-13 Investigation of drying technique for magnetic nanoparticles with high redispersibility
 °K. Nishigaki¹, S. Seino¹, M. Tanabe¹, S. Uematsu², T. Nakagawa¹ (¹Osaka Univ., ²ULVAC)
- 07aPS-14 Magnetization process analysis of concave Fe₃O₄ nanoparticles by FORCs method
 °S. Matsuo, S. Kobayashi, C. Noda, K. Takeda, S. Yallappa, R. Uwano, K. Ono (Iwate Univ.)
- 07aPS-15 Electromagnetic levitation for flexible steel plate using magnetic field from horizontal direction (Experimental consideration on decreasing deflection using attractive force)
 °A. Endo¹, K. Kawashima¹, S. Baba¹, S. Onitsuka¹, K. Ogawa², D. Uchino², K. Ikeda³, T. Kato⁴, T. Narita², H. Kato²
 (¹FIT, ²Tokai Univ., ³Hokkaido Univ. of Sci., ⁴TUT)
- 07aPS-16 Surface spin freezing for hexagonal pyramidal hcp-CoO nanoparticles
 °Y. Hotta, S. Kobayashi, C. Noda, K. Takahashi (Iwate Univ.)

Sep. 8/Room A

- TMR** **9:00 ~ 10:15** Chair: T. Nakatani (NIMS)
- 08aA-1 New physical picture on large temperature dependence of tunnel magnetoresistance: Crucial role of interfacial *s-d* exchange interaction
 °K. Masuda, T. Tadano, Y. Miura (NIMS)
- 08aA-2 Fabrication of MTJs with Co₂FeAl Heusler electrode using MBE technique
 °T. Hojo, N. Tezuka, T. Nakano, M. Tsunoda, M. Oogane (Tohoku Univ.)
- 08aA-3 Giant tunnel magnetoresistance in epitaxial Fe/MgAlO/Fe(001) magnetic tunnel junctions
 °H. Sukegawa, T. Scheike, Z. Wen, S. Kasai, S. Mitani (NIMS)
- 08aA-4 Development of fcc-Co₉₀Fe₁₀/MgAlO/Co₉₀Fe₁₀(111) fully epitaxial magnetic tunnel junctions
 J. Song^{1,2}, T. Scheike², C. He², Z. Wen², °H. Sukegawa², T. Ohkubo², K. Hono², S. Mitani^{1,2} (¹Univ. of Tsukuba, ²NIMS)
- 08aA-5 Tunneling magnetoresistance effect in magnetic tunnel junctions using L1₀-(MnCo)Al electrode and MgAl₂O₄ insulating layer
 °R. Kikuchi, M. Al-Mahdawi, M. Tsunoda, M. Oogane (Tohoku Univ.)

- Spin conduction** **10:30 ~ 11:30** Chair: H. Sukegawa (NIMS)
- 08aA-6 Anomalous Hall effect in Al-doped Cr₂O₃ thin films exhibiting spontaneous magnetization
 °I. Iino, H. Sakurai, T. Tada, K. Toyoki, R. Nakatani, Y. Shiratsuchi (Osaka Univ.)
- 08aA-7 Spin-filtering tunnel effect of perpendicularly magnetized insulative cobalt ferrite layers grown on conductive cobalt ferrite electrodes
 °M. Tanaka¹, M. Furuta¹, M. Morishita¹, T. Ichikawa¹, Y. Hung², S. Honda³, T. Ono², K. Mibu¹
 (¹Nagoya Inst. Tech., ²Kyoto Univ., ³Kansai Univ.)
- 08aA-8 The effects of the composition of NiFeCr seed layer on GMR in FeCoNi/Cu multilayer
 P. D. Kulkarni, °T. Nakatani, Z. Li, T. Sasaki, Y. Sakuraba (NIMS)
- 08aA-9 Study of HDD read sensors using anomalous Hall effect
 °T. Nakatani, P. D. Kulkarni, H. Iwasaki, H. Suto, Y. Sakuraba (NIMS)

- Spin orbit torque** **13:30 ~ 15:00** Chair: M. Tanaka (Nagoya Inst. Tech.)
- 08pA-1 Enhanced Spin Conversion Efficiency for Co₃Sn₂S₂ Compound by Ferromagnetic Phase Transition
 °T. Seki¹, Y. Lau^{1,2}, J. Ikeda¹, K. Fujiwara¹, S. Iihama¹, A. Ozawa¹, K. Nomura³, A. Tsukazaki¹
 (¹Tohoku Univ., ²CAS, ³Kyushu Univ.)
- 08pA-2 Enhancement of current to spin current conversion efficiency in synthetic antiferromagnetic layer
 °Y. Saito, S. Ikeda, T. Endoh (Tohoku Univ.)
- 08pA-3 Spin orbit torques of Gd / FeCo multilayers on Ta layer
 °S. Yanai¹, D. Oshima¹, S. Takahashi², Y. Hirayama², T. Kato¹ (¹Nagoya Univ., ²Samsung Research Inst. Jpn.)

- 08pA-4 Observation of field free spin orbit torque-induced magnetization switching in Tb-Fe alloy film with exchange bias field
 °Y. Kurokawa, M. Wakae, Y. Hamada, M. Fujimoto, M. Itoh, H. Yuasa (Kyushu Univ.)
- 08pA-5 Spin-orbit torque induced rotation of chiral-spin structure in non-collinear antiferromagnet
 °Y. Takeuchi¹, Y. Yamane¹, J. Yoon¹, R. Itoh¹, B. Jinnai¹, S. Kanai¹, J. Ieda², H. Ohno¹, S. Fukami¹ (¹Tohoku Univ., ²JAEA)
- 08pA-6 Domain structure imaging of current-induced magnetization switching process in a synthetic antiferromagnet
 °H. Masuda¹, Y. Yamane¹, T. Seki^{1,2}, K. Raab³, T. Dohi³, R. Modak², K. Uchida^{1,2}, Jun'ichi Ieda⁴, M. Klau³, K. Takanashi^{1,4}
 (¹Tohoku Univ., ²NIMS, ³Johannes Gutenberg University Mainz, ⁴JAEA)

Thin film, voltage effect

15:15 ~ 16:15

Chair: T. Horaguchi (Keio Univ.)

- 08pA-7 Magnetic multilayer design by small-data-based machine learning: Implementation of data augmentation and ensemble learning for high prediction accuracy
 °K. Nawa^{1,2}, K. Hagiwara¹, Y. Miura², K. Nakamura¹ (¹Mie Univ., ²NIMS)
- 08pA-8 Influence of heavy metal spacer layer on perpendicular exchange anisotropy in Pt/Co/Spacer(Pt, Ir, Au)/Cr₂O₃/Pt stacked films
 °H. Ekawa, J. Shen, K. Toyoki, R. Nakatani, Y. Shiratsuchi (Osaka Univ.)
- 08pA-9 Electric field control of spin dynamics in Pt/CoFeB bilayer system using PMN-PT substrate
 °H. Hitotsukabuto, R. Iimori, S. Obinata, K. Ohnishi, K. Yamada, T. Kimura (Kyushu Univ.)
- 08pA-10 Nonreciprocal Attenuation of Surface Acoustic Wave Propagating in NiFe/Pt Bilayer
 °R. Shinozaki, K. Yamanoi, Y. Nozaki (Keio Univ.)

Sep. 8/Room B

Inductors

9:00 ~ 10:15

Chair: M. Sato (Shinshu Univ.)

- 08aB-1 Orthogonal-Core-type Variable Inductor with Permanent Magnets
 °S. Aizu¹, K. Nakamura¹, T. Ohinata², K. Arimatsu² (¹Tohoku Univ., ²Tohoku Electric Power)
- 08aB-2 Development of Coupled Inductor for Current-Doubler rectification circuit
 °N. Kawada¹, H. Oyama², T. Minamisawa¹, M. Sonehara¹, T. Sato¹ (¹Shinshu Univ., ²Ajinomoto Fine-Techno)
- 08aB-3 Development of Planer Power Inductor for Beyond 10MHz Switching DC-DC Converter
 °R. Miyata, S. Kimura, N. Kawada, T. Minamisawa, M. Sonehara, T. Sato (Shinshu Univ.)
- 08aB-4 A Study on Simple Waveform Control Method in Magnetic-Properties Measurement System for Ring Core Using myRIO
 °M. Kawaguchi, Y. Hane, K. Nakamura (Tohoku Univ.)
- 08aB-5 Sensitivity enhancement of transformer coupled permeameter for characterizing a single atomized particle
 °S. Tamaru (AIST)

Actuators

10:30 ~ 11:45

Chair: K. Nakamura (Tohoku Univ.)

- 08aB-6 Development of Cylindrical Linear Actuator for Vertical Transfer (Fundamental Consideration on Effect on Thrust Characteristics with Shape)
 °H. Nosaka¹, K. Ogawa¹, D. Uchino¹, T. Kato², K. Ikeda³, A. Endo⁴, T. Narita¹, H. Kato¹
 (¹Tokai Univ., ²Tokyo Univ. of Tech., ³Hokkaido Univ. of Sci., ⁴FIT)
- 08aB-7 Development of linear motor of electromagnetic valve drive system (Fundamental consideration on actuator shape)
 °J. Kuroda¹, K. Kimura¹, Y. Majima¹, M. Tanaka¹, D. Uchino¹, K. Ogawa¹, T. Kato², K. Ikeda³, A. Endo⁴, T. Narita¹, H. Kato¹
 (¹Tokai Univ., ²Tokyo Univ. of Tech., ³Hokkaido Univ. of Sci., ⁴FIT)
- 08aB-8 A basic study on linear actuators for high-speed reciprocating motion with dual halfbach arrays (Fundamental consideration on effect of magnet arrangement on thrust characteristics)
 °M. Tanaka¹, K. Kimura¹, J. Kuroda¹, Y. Majima¹, D. Uchino¹, K. Ogawa¹, T. Kato², K. Ikeda³, A. Endo⁴, T. Narita¹, H. Kato¹
 (¹Tokai Univ., ²Tokyo Univ. of Tech., ³Hokkaido Univ. of Sci., ⁴FIT)
- 08aB-9 Cooling performance of a miniaturized magnetically driven micropump
 °R. Tanaka, T. Honda (Kyushu Inst. Tech.)
- 08aB-10 Relationship between thrust and wing structure for magnetically driven flapping Pico Air Vehicle
 °K. Uehara, T. Honda (Kyushu Inst. Tech.)

Magnetic Levitation **13:30 ~ 14:30** Chair: T. Honda (Kyushu Inst. Tech.)

- 08pB-1 Development of electromagnetic levitation system for thin steel plate with electromagnets and permanent magnets (Experimental consideration of the effect of permanent magnet arrangement on levitation performance)
°S. Kayama¹, Y. Ichikawa¹, T. Nagayoshi¹, S. Kawamura¹, K. Ogawa¹, D. Uchino¹, K. Ikeda², T. Kato³, A. Endo⁴, T. Narita¹, H. Kato¹ (¹Tokai Univ., ²Hokkaido Univ. of Sci., ³Tokyo Univ. of Tech., ⁴FIT)
- 08pB-2 Electromagnetic levitation and transportation system for bent flexible steel plate (Fundamental consideration on effect of gripping position for steel plate on levitation performance)
°S. Kawamura¹, Y. Ichikawa¹, T. Nagayoshi¹, S. Kayama¹, K. Ogawa¹, D. Uchino¹, K. Ikeda², T. Kato³, A. Endo⁴, T. Narita¹, H. Kato¹ (¹Tokai Univ., ²Hokkaido Univ. of Sci., ³Tokyo Univ. of Tech., ⁴FIT)
- 08pB-3 Development of electromagnetic guideway for seamless ultra-thin steel plate (Experimental consideration of damping effect from electromagnet)
°T. Okubo¹, R. Kano¹, H. Kato¹, D. Uchino¹, K. Ogawa¹, K. Ikeda², T. Kato³, A. Endo⁴, T. Narita¹ (¹Tokai Univ., ²HUS, ³TUT, ⁴FIT)
- 08pB-4 A study on bending magnetic suspension for flexible steel plate (Fundamental consideration on dynamic behavior of steel plate during levitation)
°R. Miyazaki¹, Y. Uchida¹, K. Funada¹, K. Ogawa¹, D. Uchino¹, K. Ikeda², T. Kato³, A. Endo⁴, T. Narita¹, H. Kato¹ (¹Tokai Univ., ²Hokkaido Univ. of Sci., ³Tokyo Univ. of Tech., ⁴FIT)

Motors **14:45 ~ 16:30** Chair: K. Fujisaki (Toyota Tech. Inst.)

- 08pB-5 Prototype Test of Asymmetric Pole Structure IPM Motor Using Bonded Magnet
°Y. Tsukada, Y. Yoshida, N. Handa, K. Tajima (Akita Univ.)
- 08pB-6 Efficiency Improvement of Outer-Rotor-type High-Speed PM motor with Segmented-shaped Rotor
°S. Sakurai, K. Nakamura (Tohoku Univ.)
- 08pB-7 Prototype Tests of Ultra High Speed Magnetic Gear
°E. Asahina¹, K. Mitsuya¹, K. Nakamura¹, Y. Tachiya², Y. Suzuki², K. Kuritani² (¹Tohoku Univ., ²Prospine)
- 08pB-8 Basic Examination of SR Motor with Aluminum Coils
°E. Asahina¹, K. Nakamura¹, K. Yanagisawa², Y. Furuya² (¹Tohoku Univ., ²Aster Co., Ltd.)
- 08pB-9 Proposal of Magnetic-Geared SR Motor for In-wheel Drive type Compact EV
°K. Ito, K. Nakamura (Tohoku Univ.)
- 08pB-10 Improvement of Current Unbalance of Transverse-Flux-type SR Motor
°A. Nagai, K. Nakamura (Tohoku Univ.)
- 08pB-11 Basic Examination of Cross-pole-type Flux-Reversal Motor
°Y. Yu, K. Nakamura (Tohoku Univ.)

Sep. 8/Room C

Hard magnetic materials (Computational science • Ferrite)

9:00 ~ 10:15

Chair: K. Koike (Yamagata Univ.)

- 08aC-1 Kronmuller formula and Landau theory—expression for coercivity using free energy landscape (1) —
°C. Mitsumata, M. Kotsugi (Tokyo Univ. Sci.)
- 08aC-2 Temperature dependence of coercivity and entropy—expression for coercivity using free energy landscape (2) —
°C. Mitsumata, M. Kotsugi (Tokyo Univ. Sci.)
- 08aC-3 Magnetic structure analysis of magnetic phase with antiferro component appearing in Ba(Fe_{1-x}Sc_x)₁₂O₁₉
°S. Tanaka¹, K. Maruyama¹, R. Kiyonagi², A. Nakao³, K. Moriyama³, Y. Ishikawa³, S. Utsumi¹ (¹Tokyo Univ. Sci., Suwa, ²JAEA, ³CROSS)
- 08aC-4 Control of Co distribution by heat treatment in La-Co co-substituted M-type Sr ferrite
°S. Arimoto, T. Waki, Y. Tabata, H. Nakamura (Kyoto Univ.)
- 08aC-5 Single crystal growth of Co substituted W-type ferrite by high oxygen pressure floating zone method
°S. Nakai, T. Waki, Y. Tabata, H. Nakamura (Kyoto Univ.)

- Hard magnetic materials (Thin film • Nanopowder) 10:30 ~ 11:45** Chair: M. Kotsugi (Tokyo Univ. Sci.)
- 08aC-6 Improvement of coercivity for Sm(Fe-Co)-B thin films by Al layer diffusion
 °Y. Mori, M. Kambayashi, S. Hatanaka, S. Nakatsuka, K. Hirayama, M. Doi, T. Shima (Tohoku Gakuin Univ.)
- 08aC-7 Fabrication of epitaxially grown Sm(Fe₈₀Co₂₀)₁₂ particulate films
 °K. Nabeta¹, R. Haga¹, N. Kikuchi¹, Y. Takahashi^{1,2}, S. Okamoto^{1,2} (¹Tohoku Univ., ²NIMS)
- 08aC-8 Phase diagrams and uniaxial magnetocrystalline anisotropy of Fe-Co-V-N films
 °T. Hasegawa, C. Shirai, T. Nishikawa (Akita Univ.)
- 08aC-9 bct structure and uniaxial magnetic anisotropy of V-N added Fe-Co films
 °C. Murakami, T. Hasegawa (Akita Univ.)
- 08aC-10 Massive transformation in FeNi nanopowders with nanotwin-assisted nitridation
 °J. Wang¹, Y. Hirayama¹, Z. Liu¹, K. Suzuki¹, W. Yamaguchi¹, K. Park¹, K. Takagi¹, H. Kura², E. Watanabe², K. Ozaki¹
 (¹AIST, ²DENSO)
- High frequency materials 13:15 ~ 14:45** Chair: M. Naoe (DENJIKEN)
- 08pC-1 Study on magnetic properties of mixed and oriented soft magnetic particles composites
 °K. Wakabayashi, K. Murata, T. Miyazaki, H. Masumoto, Y. Endo (Tohoku Univ.)
- 08pC-2 Development of pressed magnetic core reactor for converter/inverter system for shinkansen electric equipment
 °T. Kanaya, T. Sato, M. Sonehara (Shinshu Univ.)
- 08pC-3 Broadband iron loss measurements in a Sendust dust core using 2-coil and capacitance cancellation methods
 °N. Ono¹, Y. Uehara², Y. Endo^{3,4}, S. Yoshida¹, H. Oikawa⁵, N. Kikuchi¹, S. Okamoto^{1,4,6}
 (¹IMRAM, Tohoku Univ., ²Magnetic Device Laboratory, ³Graduate School of Eng. Tohoku Univ.,
⁴CSIS, Tohoku Univ., ⁵TOKIN, ⁶NIMS)
- 08pC-4 Study on Structure and Magnetic Properties of Pure Fe ribbons with Annealing Treatment
 X. Ma¹, L. Umetsu¹, T. Miyazaki¹, S. Mikami², T. Hiraki², °Y. Endo¹ (¹Tohoku Univ., ²TOHO ZINC)
- 08pC-5 Effects of oxygen gas flow on magnetic property of CoZrO films formed by reactive facing target sputtering
 °T. Kaneko, H. Nitta, Y. Takamura, S. Nakagawa (Tokyo Inst. Tech.)
- 08pC-6 Development of Fe₂B powders as noise suppression materials for 5G communications
 °H. Sepehri-Amin¹, P. Tozman¹, X. Tang¹, S. Tamaru², T. Igarashi³, S. Okamoto⁴, T. Ohkubo¹, K. Hono¹
 (¹NIMS, ²AIST, ³TOKIN, ⁴Toho Univ.)
- Soft magnetic materials 15:00 ~ 16:45** Chair: S. Okamoto (Tohoku Univ.)
- 08pC-7 γ' Phase Formation in Fe-N Thin Films Prepared on Single-Crystal Substrates by Reactive DC and RF Sputtering
 °Y. Maeda¹, K. Imamura¹, M. Ohtake¹, S. Isogami², T. Kawai¹, M. Futamoto¹, F. Kirino³, N. Inaba⁴
 (¹Yokohama National Univ., ²NIMS, ³Tokyo Univ. of Arts, ⁴Yamagata Univ.)
- 08pC-8 Epitaxial Growth of γ'-Fe₄N Thin Films on MgO Substrates of (110) and (111) Orientations
 °K. Imamura¹, Y. Maeda¹, M. Ohtake¹, S. Isogami², M. Futamoto¹, T. Kawai¹, F. Kirino³, N. Inaba⁴
 (¹Yokohama National Univ., ²NIMS, ³Tokyo Univ. of Arts, ⁴Yamagata Univ.)
- 08pC-9 Guidelines for realization of FeAlSi films with soft magnetic properties by control of composition and atomic ordering
 °S. Akamatsu, T. Nakano, M. Tsunoda, Y. Ando, M. Oogane (Tohoku Univ.)
- 08pC-10 Uniaxial anisotropy of ferromagnetic nanogranular films consisting of binary CoFe alloys and fluorides
 °M. Naoe¹, M. Sonehara², Y. Endo³, N. Kobayashi¹, K. Arai¹ (¹DENJIKEN, ²Shinshu Univ., ³Tohoku Univ.)
- 08pC-11 Soft Magnetization of NiFeMo Thin Films using Non-magnetic Cu Intermediate Layer
 °Y. Hrayama, Y. Ashizawa, K. Nakagawa (Nihon Univ.)
- 08pC-12 Control of Magnetic Properties due to Co substitutions for Zinc Iron Ferrite Film
 °N. Adachi, K. Naniwa, Y. Nakata, K. Shinkai (Nagoya Inst. Tech.)
- 08pC-13 Synthesis of Fe²⁺, Ti⁴⁺ substituted hexaferrites
 °S. Nakahara, K. Kamishima, K. Kakizaki (Saitama Univ.)

Sep. 8/Room D

Assisted Recording

9:15 ~ 10:15

Chair: A. Tsukamoto (Nihon Univ.)

- 08aD-1 The effect of thermal activation on microwave assisted magnetization switching
°S. Mizutani, N. Kikuchi, M. Hatayama, T. Shimatsu, S. Okamoto (Tohoku Univ.)
- 08aD-2 Effect of film thickness on microwave assisted switching behavior
°N. Kikuchi, K. Sato, M. Hatayama, T. Shimatsu, S. Okamoto (Tohoku Univ.)
- 08aD-3 Estimation of microwave-assisted magnetization switching field by energy approximation
°K. Kawakami, X. Ya, T. Tanaka (Kyushu Univ.)
- 08aD-4 Study of thicknesses of recording layers and spacing between them for 3D heat-assisted magnetic recording
°K. Maeda, H. Akagi (Kogakuin Univ.)

Recording Media and Systems

10:30 ~ 11:30

Chair: N. Kikuchi (Tohoku Univ.)

- 08aD-5 U-Net image segmentation for statistical analysis of granular FePt recording media and automated dataset generation
°N. Kulesh, A. Bolyachkin, I. Suzuki, Y. Takahashi, H. Sepeshri-Amin (NIMS)
- 08aD-6 Evaluation of light atomic element dissolved in magnetic grains with unit cell analysis for $L1_0$ -typed FePt based films with unit cell analysis
°D. Isurugi¹, G. Tanaka¹, T. Saito¹, K. Tham², T. Ogawa¹, S. Saito¹ (¹Tohoku Univ., ²TANAKA)
- 08aD-7 Fabrication of regularly arranged $L1_0$ -FePt fine particulate with combination of rapid thermal annealing and microfabrication
°Y. Shimizu, H. Yoshikawa, A. Tsukamoto (Nihon Univ.)
- 08aD-8 Evaluation study of data access performance of distributed storage Ceph, using a brain neuronal structure visualization tool
°Y. Kawada, Y. Tanaka (Tohoku Univ.)

Medical applications of magnetic beads

13:00 ~ 14:45

Chair: T. Uchiyama (Nagoya Univ.)

- 08pD-1 Frequency spectrum analysis of magnetic linear dichroism in suspension of magnetic nanoparticles
°M. Suwa, H. Emura, S. Tsukahara (Osaka Univ.)
- 08pD-2 Evaluation of distribution of interdependent parameters in magnetic nanoparticles
°H. Goto¹, Y. Akita¹, R. Takahashi¹, H. Hirano³, M. Futagawa¹, Y. Takemura², S. Ota¹
(¹Shizuoka Univ., ²Yokohama National Univ., ³Fujita Health Univ.)
- 08pD-3 Basic research on the number dependence of magnetization of chainlike magnetic nanoparticles
°H. Zhang, K. Ikeda, T. Sasayama, T. Yoshida (Kyushu Univ.)
- 08pD-4 Evaluation of magnetic relaxation of magnetic nanoparticles in tumors
°K. Honda¹, K. Shimizu², M. Futagawa¹, Y. Takemura³, S. Ota¹
(¹Shizuoka Univ., ²Hamamatsu Univ. School of Medicine, ³Yokohama National Univ.)
- 08pD-5 Development of gold-coated magnetic nanoparticles for magnetic hyperthermia and micro-CT imaging applications
°L. Tonthat¹, T. Ogawa¹, N. Kitamura¹, Y. Kobayashi², K. Gonda¹, S. Yabukami¹ (¹Tohoku Univ., ²Ibaraki Univ.)
- 08pD-6 AC magnetization and self-heating properties of commercial superparamagnetic magnetic nanoparticles
°H. Obana¹, S. Ota², S. Takeuchi¹, S. Trisnanto¹, T. Yamada¹, Y. Takemura¹ (¹Yokohama National Univ., ²Shizuoka Univ.)
- 08pD-7 Heating of magnetic particles by application of high frequency pulsed magnetic field
°Y. Adachi¹, A. Kuwahata¹, S. Yabukami¹, E. Nakamura² (¹Tohoku Univ., ²KEK)

Medical technology

15:00 ~ 17:00

Chair: A. Kuwahata (Tohoku Univ.)

- 08pD-8 Development of Feedback Type Peak to Peak Voltage Detector MI Gradiometer for multichannel measurement
°S. Idachi¹, T. Uchiyama¹, J. Ma² (¹Nagoya Univ., ²TOYOTA Central R&D Labs.)
- 08pD-9 Misalignment of Sensor Position and Analysis Area on Current Source Estimation of MCG.
°M. Iwai¹, K. Kobayashi¹, W. Sun² (¹Iwate Univ., ²Kinki Univ.)
- 08pD-10 State identification of magnetic nanoparticles using harmonic magnetization
°S. Yamamura, J. Goto, M. Yasutake, K. Enpuku, T. Yoshida (Kyushu Univ.)

- 08pD-11 Method for Rapid Detection of Bacteria Using Magnetic Nanoparticle Aggregates
 °Y. Pu, H. Zhao, T. Murayama, L. Tonthat, K. Okita, Y. Watanabe, S. Yabukami (Tohoku Univ.)
- 08pD-12 A simple antigen-antibody reaction using ultrasmall FeCo nanoparticles
 °L. Tonthat¹, T. Murayama¹, N. Kobayashi², S. Yabukami¹, W. Ikeda-Ohtsubo¹, K. Arai² (¹Tohoku Univ., ²DENJIKEN)
- 08pD-13 pT-field mapping by using magnetoresistive sensor array for magnetic particle imaging
 °S. Trisnanto¹, T. Kasajima², T. Akushichi², Y. Takemura¹ (¹Yokohama National Univ., ²TDK)
- 08pD-14 Development of Superconducting DC Gradient and Copper AC Magnetic Field Coils for Large-sized Magnetic Particle Imaging Scanner
 °H. Morioka¹, M. Yoshimoto¹, T. Sasayama¹, Y. Takemura², T. Yoshida¹ (¹Kyushu Univ., ²Yokohama National Univ.)
- 08pD-15 Drive and receive coils for head-size magnetic particle imaging
 °K. Suzuki¹, H. Ahn¹, S. Trisnanto¹, T. Yamada¹, S. Ota², T. Yoshida³, Y. Takemura¹
 (¹Yokohama National Univ., ²Shizuoka Univ., ³Kyushu Univ.)

Sep. 8/Room E

Symposium "Arrangement and orientation control of fine particles by magnetic field and its application"

Chief Organizer: M. Yamato (Tokyo Metropolitan Univ.)

9:00 ~ 10:30

Chair: N. Hirota (NIMS)

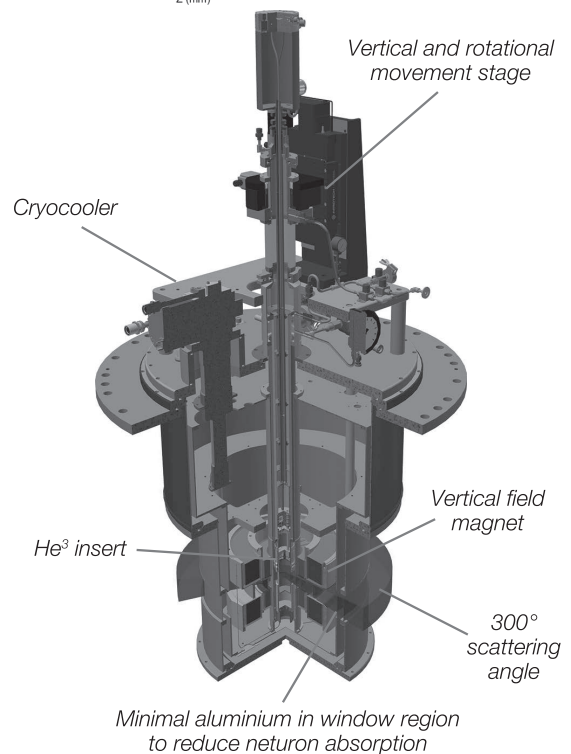
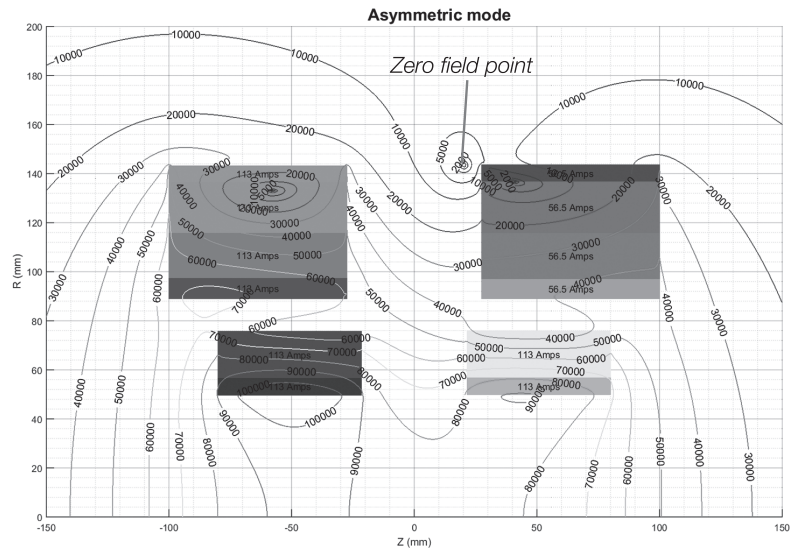
- 08aE-1 Magnetic Orientation of Diamagnetic Particles (30min.)
 °T. Kimura (Fukui Univ. Tech.)
- 08aE-2 Field-induced rotational oscillation of diamagnetic and paramagnetic materials caused by a permanent magnet (30min.)
 °C. Uyeda (Osaka Univ.)
- 08aE-3 Recent progress in three dimensional magnetic alignment techniques (30min.)
 °S. Horii, W. B. Ali, S. Adachi, F. Kimura (KUAS)

10:45 ~ 11:45

Chair: A. Sugiyama (Yoshino Denka Kogyo)

- 08aE-4 Control of the orientation of inorganic particles in a magnetic field by addition of metal elements (30min.)
 °S. Tanaka (Nagaoka Univ. Tech.)
- 08aE-5 Preparation of Crystalline Oriented Poly(L-lactide) Films by Casting in a Magnetic Field Using Ionic Liquids, and those of the Useful (30min.)
 °H. Ikake¹, S. Shimizu¹, S. Hara² (¹Nihon Univ., ²Kanagawa Univ.)

中性子散乱研究用無冷媒垂直磁場対称 / 非対称スプリットペアマグネットシステム



- 10T 対称磁場マグネットモード運転
- 8.4T 非対称磁場マグネットモード運転
(ゼロ磁場点が磁場中心面(Z=0)から20mm移動)
- 中性子吸収を最小限に抑えるために最適化された
マグネットコイル巻枠
- 試料空間は<1.6 Kから375 Kまでの温度制御
が可能
- 300mKまでの温度に対応する³Heインサート
- ±180° 回転方向、±15mm鉛直方向の移動が可
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Technology Communication

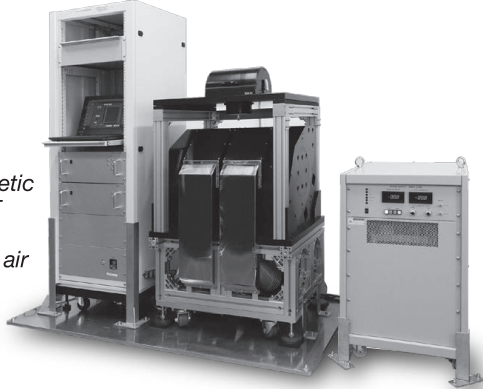
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TOEI Scientific Industrial challenges new technologies as the R&D oriented manufacturer.

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Vibrating Sample Magnetometer

Model for higher magnetic field and higher sensitivity measurements, ideal for measuring ultra-thin films in the nm range.

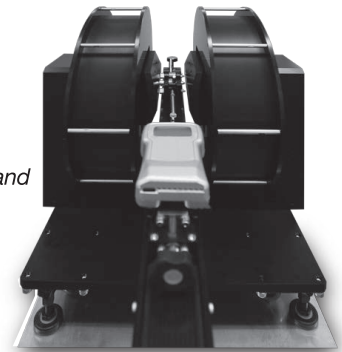
Features
Maximum magnetic field strength:3T
Coil cooling method: Forced air cooling



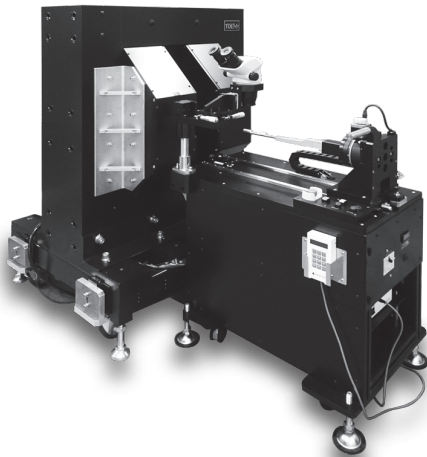
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Under Development!
The magnetostriction measuring equipment for thin magnetic strips under 60um thickness.

Features
Provide higher accuracy and resolution than the conventional strain gauge method equipment.



High Sensitivity VNA-FMR Spectrometer



Magnetic Field Prober

Main Model

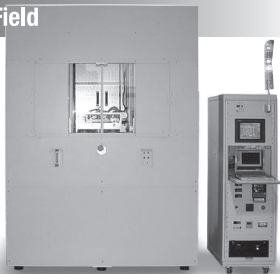
Omni-Directional magnetic field prober
Vertical magnetic field prober
In-plane magnetic field prober
Rotating magnetic field prober

Prober type

Full-automatic
Semi-automatic
Manual



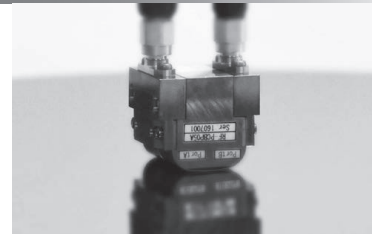
Furnaces with Magnetic Field



3D Magnetic Field Profiler



Micro Strip Line Probe



Low Residual Field Electromagnets

Electromagnets

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

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Head Office

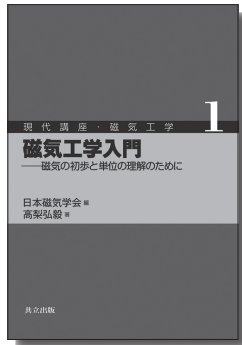
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[日本磁気学会 編]

現代講座・磁気工学



【各巻：A5判・上製本】

学部上級生から修士・若手技術者を主対象に、新機軸の研究対象と基礎的要素を結びつける重要な基礎理論を丁寧に解説。教科書や解説書など幅広く活用できる。

① 磁気工学入門 —磁気の初歩と単位の理解のために—

日本磁気学会『平成23年度出版賞』受賞

高梨弘毅著……………132頁・定価3080円

② 磁気工学の解析法

日本磁気学会『令和元年度出版賞』受賞

三俣千春著……………236頁・定価3740円

③ スピントロニクス —基礎編—

日本磁気学会『平成30年度出版賞』受賞

井上順一郎・伊藤博介著……………294頁・定価4180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・定価4400円

マグネティクス・ライブラリー



【各巻：A5判・上製本】

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。重要なトピクスは紙面を割き詳解。

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

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③ 反強磁性体 —応用への展開—

日本磁気学会『平成29年度出版賞』受賞

深道和明著……………344頁・定価5500円

マグネティクス・イントロダクション



【各巻：A5判・並製本】

磁気の初学者および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、第一線の研究者がやさしく正確に解説する。

① 磁気工学超入門 —ようこそ、まぐねの国へ—

佐藤勝昭著……………166頁・定価2750円

② メタマテリアルのつくりかた —光を曲げる「磁場」とベリー位相—

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富田知志・澤田 桂著……………224頁・定価2750円

スピンと磁気を用いたエネルギーハーベスティング

水口将輝・藤田麻哉著……………続刊

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まぐね

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	5号	(10月発行)	6号	(12月発行)
2021年 16巻	1号	(2月発行)	2号	(4月発行)
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Journal of The Magnetics Society of Japan (CDおよびオンライン発行)

2020年 44巻	1号	(1月発行)	2号	(3月発行)
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	5号	(9月発行)		

日本磁気学会 研究会資料

第227回	2020年9月28日	X線とレーザーの融合による磁性ダイナミクス
第228回	2020年10月26日	磁気計測を利用した非破壊検査技術とインフラ診断応用
第229回	2020年11月11日	テラヘルツ領域におけるスピントロニクス研究の現状と展望
第230回	2020年12月22日	高度スマートグリッドシステム実現のための磁気センサ技術
第231回	2021年3月30日	磁気が拓くイノベーション
第232回	2021年5月12日	磁場の時空間制御と弱磁性物質への応用
第233回	2021年10月26日	磁気記録技術の最近の研究動向
第234回	2021年11月22日	医療分野での磁気関連技術の新展開
第235回	2022年1月19日	磁性材料の分析評価技術の進展
第236回	2022年2月9日	新しい磁性研究のための量子ビームと計算科学の連携利用
第237回	2022年7月20日	スピントロニクスのエネルギーハーベスティングへの展開

日本磁気学会 学術講演会概要集

第43回	2019年9月25日～27日	京都大学
第44回	2020年12月14日～17日	オンライン開催
第45回	2021年8月31日～9月2日	オンライン開催

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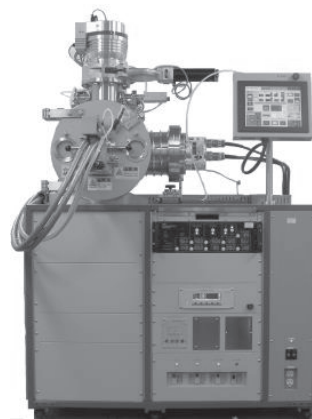
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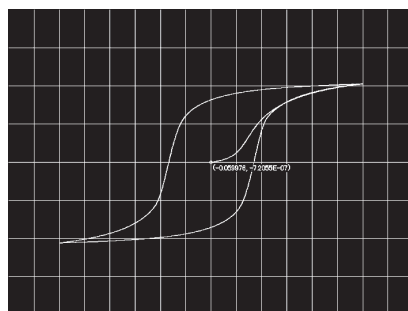
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磁気特性アナライザ

軟磁性材料に最適！

測定モード

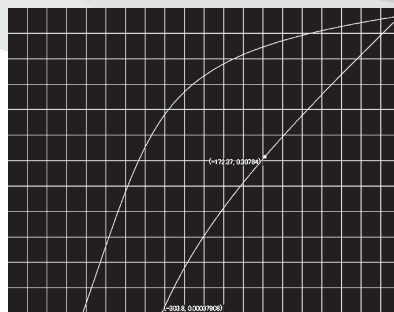
- ・ 直流磁化特性
- ・ 非履歴磁化特性
- ・ 偏磁磁化特性
- ・ 交流磁化特性



BH-1000



軟磁性材料（ソフト材）の各種磁化特性を測定。オリジナルサンプリング方式を採用し、ドリフトレスを実現。任意波形によるマイナーループなどの実環境下での測定が可能。



硬磁性材料に最適！

測定モード

- ・ 直流磁化特性
- ・ 高保磁力材料減磁特性

硬質磁性材料（ハード材）の各種磁気特性を測定。オプションで軟磁性材料測定機能も搭載可能。BH-1000と同様、ドリフトレス。減磁曲線のリコイル透磁率算出に役立つ任意波形機能も標準搭載。

BH-1000H

※カタログの仕様及び外観等は、改良の為予告なしに変更する場合がございます。

極微小信号を忠実に増幅

低雑音

広帯域

高安定

電圧アンプ

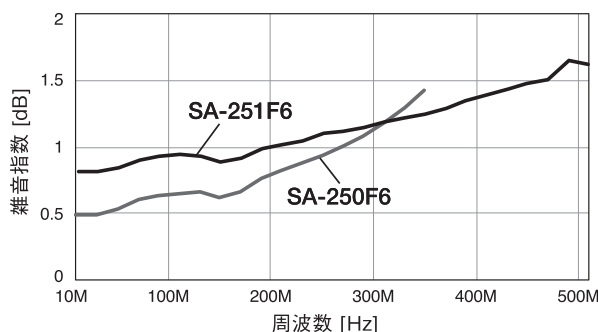
雑音指数

(ノイズフィギュア)

周波数帯域

0.9dB / 1 kHz ~ 500 MHz
0.6dB / 100 Hz ~ 250 MHz

■世界最高レベルの低雑音特性



■豊富なモデル

周波数帯域、入力形式、入力インピーダンスによって、11種類をラインナップ

電流アンプ

利得

100G (V/A)

周波数帯域

DC ~ 2kHz

■最高100G (V/A) 高利得と広帯域を両立

10M/100M/1G/10G/100G (V/A)、5種類の利得をラインナップ

■センサ・接続ケーブルの容量に対して安定

■低雑音 ■ローパスフィルタ出力装備

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250 MHz

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- NMR 用電磁波センサ
- 量子コンピュータにおける超電導デバイス
- SQUID センサ

新登場


 SA-608F2
100 G V/A

Application

- フォトダイオード、磁気ピックアップの出力増幅
- 電子顕微鏡／走査型電子顕微鏡の検出器として

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3T(30kG)
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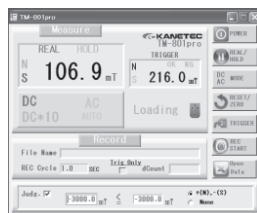
- 0~3000mTの広い測定レンジを有する。
- 高分解能モードにより、高精度な測定が可能。
(分解能0.01mT)
- 防塵性に優れるシートキーを採用。
- 電池のムダな消費を防ぐ
オートパワーOFF機能搭載。
- 研究開発・品質管理に活用
可能なサンプルソフトを無償
ダウンロード提供。



ACアダプタ接続口



USBケーブル接続口

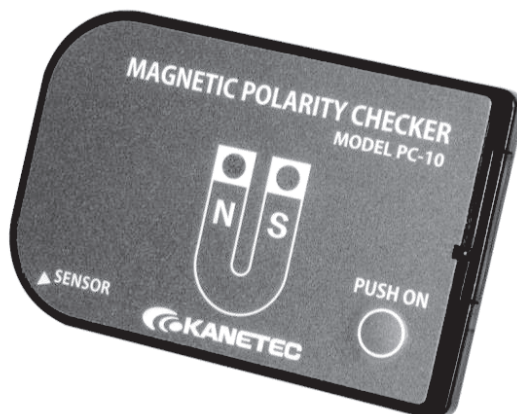


校正証明書(メーカー校正又はJCSS校正)の発行も承ります(有償)

マグネティックポラリティチェッカー PC-10

残留磁束密度の簡易チェック。 N/S極性判別は!

- 判別結果をランプと音のダブルでお知らせ!
- 磁束密度約1mT以上を感知するため、簡易的な脱磁確認に応用可能。



判別性能:N/S約1mT(10G)以上

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世界初! 高温超電導型VSM

新製品

TOEI

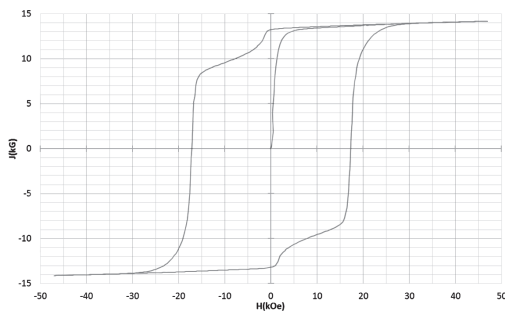
世界初*、高温超電導マグネットをVSMに採用することで
測定速度 当社従来機 1/20 を実現。

0.5mm cube 磁石のBr, HcJ 高精度測定が可能と
なりました。

*2014年7月 東英工業調べ

測定結果例

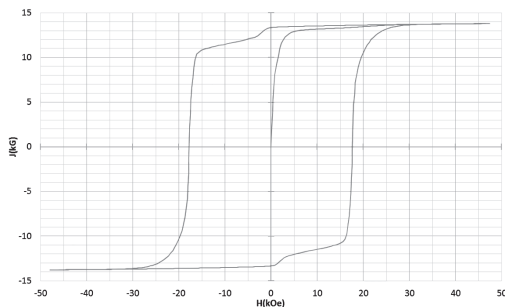
高温超電導VSMによるNdFeB(sint.) 0.5mm cube BHカーブ



磁化測定レンジ: 0.2emu

Br = 13.2kG HcJ = 17.2kOe

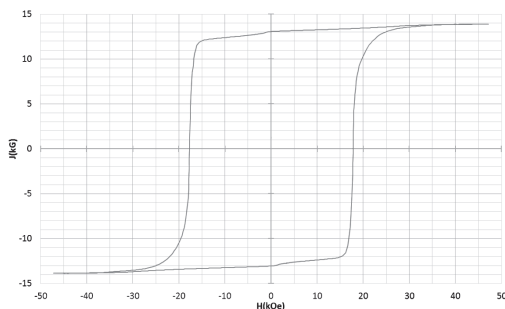
高温超電導VSMによるNdFeB(sint.) 1mm cube BHカーブ



磁化測定レンジ: 2emu

Br = 13.3kG HcJ = 17.7kOe

高温超電導VSMによるNdFeB(sint.) 4mm cube BHカーブ



磁化測定レンジ: 100emu

Br = 13.1kG HcJ = 17.8kOe



高速測定を実現

高温超電導マグネット採用により、高速測定を
実現しました。Hmax = 5Tesla, Full Loop 測定が
2分で可能です。

(当社従来機: Full Loop 測定 40分)

小試料のBr, HcJ 高精度測定

0.5mm cube 磁石のBr, HcJ 高精度測定ができ、
表面改質領域を切り出しBr, HcJの強度分布等、
微小変化量の比較測定が可能です。

また、試料の加工劣化の比較測定が可能です。

試料温度可変測定

-50°C ~ +200°C 温度可変UNIT (オプション)

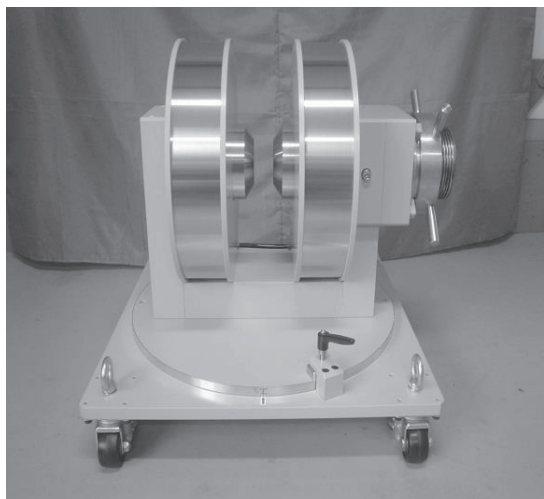
磁界発生部の小型化

マグネットシステム部寸法: 0.8m × 0.3m × 0.3m

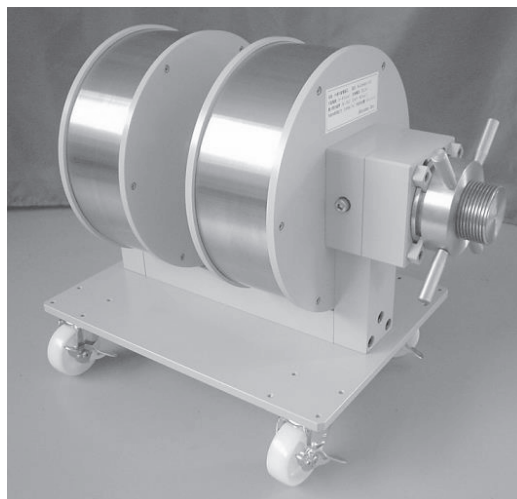
電磁石 ヘルムホルツコイル等 設計製作

各種の電磁石を設計製造しております。

電磁石専用電源(バイポーラ、ユニポーラ)も用意しております。



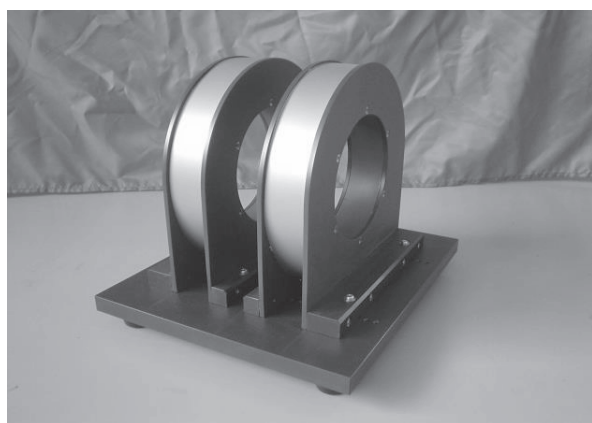
回転台付 片側可変電磁石



片側可変電磁石

ヘルムホルツコイルその他各種コイルを設計製造いたしております。

中空銅線を使用したコイルも製作可能です。



ヘルムホルツコイル



3Dヘルムホルツコイル

* その他の製品についてもお気軽にお問合せください

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