

PROGRAM

Dec. 14/Room A

Spin wave		9:00 ~ 10:30	Chair: E. Shikoh (Osaka City Univ.)
14aA-1	Reservoir computing by spin-wave interferometry using Fe single crystals		°Y. Koya, K. Sekiguchi (Yokohama National Univ.)
14aA-2	Strong reflection of spin wave by a periodic modulation field		°M. Iwaba, K. Sekiguchi (Yokohama National Univ.)
14aA-3	Study of spin-wave propagation in a magnetic domain wall		°S. Nezu, K. Sekiguchi (Yokohama National Univ.)
14aA-4	Study of Magnetization Gradient effect on Spin-Wave Propagation		°T. Eguchi, Y. Naemura, K. Sekiguchi (Yokohama National Univ.)
14aA-5	Magnon-generation process detected by a time-resolved Brillouin light scattering spectroscopy		°K. Oda, M. Iwaba, K. Sekiguchi (Yokohama National Univ.)
14aA-6	Noise evaluation in magnon devices		°R. Furukawa, M. Iwaba, K. Sekiguchi (Yokohama National Univ.)

Spin current		10:45 ~ 12:15	Chair: K. Yamada (Gifu Univ.)
14aA-7	Ferromagnetic layer thickness dependence of laser stimulated spin current in $\text{Co}_x\text{Fe}_{100-x}/\text{Pt}$ thin films		°Y. Sasaki ¹ , Y. Takahashi ¹ , S. Kasai ^{1,2} (¹ NIMS, ² JST-PREST)
14aA-8	Variation of spin sink efficiency in Dy/NiFe bilayer owing to magnetic phase transition		°K. Yamanoi ¹ , Y. Sakakibara ¹ , J. Fujimoto ² , M. Matsuo ^{2,3,4} , Y. Nozaki ^{1,5} (¹ Keio Univ., ² UCAS, ³ JAEA, ⁴ RIKEN, ⁵ Keio Spintronics Center)
14aA-9	Measurement of the spin Hall voltage of Dy using thermally excited spin current		°Y. Sakakibara ¹ , K. Yamanoi ¹ , Y. Nozaki ^{1,2} (¹ Dept. of Phys. Keio Univ., ² Keio Spintronics Center)
14aA-10	Temperature dependence of electromotive forces in $\text{Ni}_{80}\text{Fe}_{20}/\text{VO}_2$ bilayer junctions under the ferromagnetic resonance		°K. Tamura ¹ , T. Kanki ² , S. Shirai ¹ , H. Tanaka ² , Y. Teki ³ , E. Shikoh ¹ (¹ Osaka City Univ. Eng., ² ISIR, Osaka Univ., ³ Osaka City Univ. Sci.)
14aA-11	Spin-pump-induced spin transport in thermally-evaporated rigid molecular films		K. Nishida, Y. Teki, °E. Shikoh (Osaka City Univ.)
14aA-12	spin transport in thermally-evaporated organic-semiconductor naphthyl diamine films		°Y. Onishi, Y. Teki, E. Shikoh (Osaka City Univ.)

Symposium "Recent progress of spintronics and future materials"

Chief Organizer: H. Tabata (Univ. of Tokyo)

		13:00 ~ 14:30	Chair: H. Tabata (Univ. of Tokyo)
14pA-1	Renaissance of Ferromagnetic Semiconductors and Spintronics Applications (30 min.)		°M. Tanaka (Univ. of Tokyo)
14pA-2	Room-temperature germanium spintronics developed by atomically controlled heterointerfaces (30 min.)		°K. Hamaya (Osaka Univ.)
14pA-3	Spintronics using local angular momentum of surface acoustic wave (30 min.)		°Y. Nozaki ^{1,5} , S. Tateno ¹ , Y. Kurimune ¹ , M. Matsuo ^{2,3,4} , S. Maekawa ^{2,4} (¹ Keio Univ., ² UCAS, ³ JAEA, ⁴ RIKEN, ⁵ CSRN Keio Univ.)

14:45 ~ 16:15

Chair: N. Kikuchi (Tohoku Univ.)

- 14pA-4 Controlling antiferromagnetic resonances (30 min.)
°T. Moriyama¹, K. Hayashi², K. Yamada², M. Shima², Y. Ohya², Y. Tserkovnyak³, T. Ono¹
(¹Kyoto Univ., ²Gifu Univ., ³Univ. of California)
- 14pA-5 Interfacial multiferroics with perpendicular magnetic anisotropy (30 min.)
°T. Taniyama (Nagoya Univ.)
- 14pA-6 Electric operation of magnetic skyrmions (30 min.)
°S. Kasai (NIMS, JST-PREST)

IEEE DL lecture

17:00 ~ 18:00

Chair: S. Nakagawa(Tokyo Inst. Tech.)

- 14pA-7 Antiferromagnetic Insulatronics: Spintronics without magnetic fields
°M. Kläui (Johannes Gutenberg-Univ.)

Dec. 14/Room B

Symposium "Electromagnetic responses in wideband from GHz to visible light region"

Chief Organizer: T. Ishibashi (Nagaoka Univ. Tech.)

13:00 ~ 15:00

Chair: T. Ishibashi (Nagaoka Univ. Tech.)

- 14pB-1 Study of magnetic properties at the interface in ultra-thin CoFeB films using a high sensitivity VNA-FMR spectrometer (30 min.)
°S. Tamaru, T. Yamamoto (AIST)
- 14pB-2 Magnonic band gaps of metallic one-dimensional magnonic crystals (30 min.)
°T. Manago, K. Kasahara (Fukuoka Univ.)
- 14pB-3 Imaging of microwave electric- and magnetic-fields by optical indicator microscopy (30 min.)
°K. Lee¹, H. Parsamyan^{1,2}, A. Babajanyan², Z. Baghdasaryan^{1,2} (¹Sogang Univ., ²Yerevan State Univ.)
- 14pB-4 Observation of magnon polarization through neutron scattering (30 min.)
°Y. Nambu (Tohoku Univ.)
- 15:15 ~ 16:45
- Chair: K. Tanabe (Toyota Tech. Inst.)
- 14pB-5 Efficient terahertz frequency conversion in a Dirac semimetal Cd₃As₂ and terahertz anomalous Hall effect in a Weyl antiferromagnet Mn₃Sn (30 min.)
°R. Matsunaga, N. Kanda, T. Matsuda (Univ. of Tokyo)
- 14pB-6 Designing spin textures and topological transports in insulating antiferromagnets (30 min.)
°C. Hotta, M. Kawano (Univ. of Tokyo)
- 14pB-7 Circularly polarized microwave measurements for condensed matter physics (30 min.)
°T. Arakawa (Osaka Univ.)

Dec. 14/Room C

Power magnetics: Motor, converter I

9:15 ~ 10:30

Chair: T. Narita (Tokai Univ.)

- 14aC-1 Fabrication of LLC-LC resonant DC-DC converter using Fe-based composite magnetic core leakage transformer
°K. Sato, T. Minamisawa, M. Sonehara, T. Sato (Shinshu Univ.)
- 14aC-2 Basic Study on Magnetic Flux Density Distribution in Three Phase Hybrid-core Structure
°C. Kobayashi, N. Kurita, M. Ogi, A. Nishimizu, A. Yamagishi (Hitachi)
- 14aC-3 A Consideration of Magnetostriction Force Calculation for Transformer Core by Using Reluctance Network Analysis
°Y. Hane¹, K. Nakamura¹, N. Kurita² (¹Tohoku Univ., ²Hitachi)
- 14aC-4 A new approach for variable transformer by means of flux control
°O. Ichinokura¹, K. Arimatsu², T. Ohinata² (¹Tohoku Univ., ²Tohoku Electric Power)
- 14aC-5 Permanent magnet type current limiter for arcing protection circuit
°O. Ichinokura¹, H. Sekimoto² (¹Tohoku Univ., ²H. S. Electric)

Power magnetics: Motor, converter II 10:45 ~ 12:00 Chair: M. Sonehara (Shinshu Univ.)

- 14aC-6 Prototype Tests of Outer Rotor type High-Speed PM Motor
°S. Sakurai, K. Nakamura (Tohoku Univ.)
- 14aC-7 Prototype Evaluation of High-Speed SR Motor made of NANOMET laminated Core
°A. Nagai¹, K. Mitsuya¹, S. Hiramoto², K. Nakamura¹ (¹Tohoku Univ., ²Tohoku Magnet Institute Co., Ltd.)
- 14aC-8 Hysteresis Analysis of DC-Biased Reactor by using Magnetic Circuit Model Combined with Play Model
°Y. Hosono, Y. Hane, K. Nakamura (Tohoku Univ.)
- 14aC-9 Applicability Study of Iron Loss Calculation Methods for Various Core Materials under Rectangular Voltage Excitation with Various Duty Ratios
°T. Hatakeyama¹, K. Nakamura² (¹Hitachi, ²Tohoku Univ.)
- 14aC-10 High-Frequency Loss and split structure of Litz Wire
°E. Asahina¹, Y. Ueda¹, A. Nagai², M. Ishitobi¹ (¹Nara Nat. Coll. Tech., ²Tohoku Univ.)

Power magnetics: driving system by magnetics I 13:00 ~ 14:30 Chair: K. Nakamura (Tohoku Univ.)

- 14pC-1 Connecting method for magnetically driven micropump using flapping wings
°T. Fukuda, T. Honda (Kyushu Inst. Tech.)
- 14pC-2 Relationship between thrust and wing structure for magnetically driven wing Pico Air Vehicle
°K. Hirano, T. Honda (Kyushu Inst. Tech.)
- 14pC-3 Development of electromagnetic levitation system for thin steel plate with electromagnets and permanent magnets (optimization of permanent magnet arrangement for applied position of electromagnetic force)
°B. Muhammad Nur Hakimi, S. Kayama, A. Shiina, K. Ogawa, A. Endo, T. Narita, H. Kato (Tokai Univ.)
- 14pC-4 Electromagnetic levitation and transportation system for bent thin steel plate (effect of bending direction on levitation performance during transportation)
°A. Shiina, S. Kayama, B. Muhammad Nur Hakimi, K. Ogawa, T. Narita, H. Kato (Tokai Univ.)
- 14pC-5 Development of electromagnetic guideway for seamless ultra-thin steel plate (effect of vibration suppression against input vibration disturbance)
°R. Nakasuga, Y. Narawa, S. Ishihara, R. Yamaguchi, K. Ogawa, T. Narita, H. Kato (Tokai Univ.)
- 14pC-6 Consideration on dynamic analysis of electromagnetic levitation system for bent thin steel plate with finite difference method
°K. Funada, R. Miyazaki, K. Ogawa, T. Narita, H. Kato (Tokai Univ.)

Power magnetics: driving system by magnetics II 14:45 ~ 15:45 Chair: H. Goto (Utsunomiya Univ.)

- 14pC-7 Development of noise control system for ultra-compact mobility by plate vibration (fundamental consideration on performance of giant magnetostrictive actuator)
°T. Kato, T. Kitamura, F. Maehara, H. Nakayama, K. Ikeda, A. Endo, H. Kato, T. Narita (Tokai Univ.)
- 14pC-8 Performance Improvement of Spoke-shaped Interior Permanent Magnet Magnetic Gear
°Y. Mizuana¹, K. Nakamura¹, Y. Suzuki², Y. Oishi², Y. Tachiya², K. Kuritani² (¹Tohoku Univ., ²Prospine)
- 14pC-9 Study of wireless haptic display using magnetic torque with magnet vibration
°Y. Sano, S. Hashi, K. Ishiyama (Tohoku Univ.)
- 14pC-10 Development of excitation coils for high-frequency magnetization measurement using a flexible substrates
°K. Mori, T. Mannen, T. Isobe, H. Yanagihara (Univ. of Tsukuba)

Hard magnetic materials 16:00 ~ 16:45 Chair: G. Obara (Meiji Univ.)

- 14pC-11 Theoretical study for the orbital moment of the Sm ions of SmFe₁₂ with GGA+U method.
°S. Yamashita^{1,2}, T. Yoshioka^{1,2}, H. Tsuchiura^{1,2}, P. Novak³ (¹Tohoku Univ., ²ESICMM, ³ASCR)
- 14pC-12 Structure and magnetic properties of Sm(Fe_{0.8}Co_{0.2})₁₂ thin films by the addition of light elements
°M. Kambayashi¹, H. Kato¹, Y. Mori¹, M. Doi^{1,2}, T. Shima^{1,2} (¹Tohoku Gakuin Univ., ²ESICMM)
- 14pC-13 Study on single phase of high concentration La-Co substituted SrM type ferrite
°K. Hani, T. Waki, Y. Tabata, H. Nakamura (Kyoto Univ.)

Dec. 14/Room D

Sensor	9:00 ~ 10:30	Chair: H. Yanagihara (Tsukuba Univ.)
14aD-1	Peak Resolution using Magnetic Fiber Sensing by Magneto-Impedance Effect °K. Takenaka, N. Noguchi (Yokogawa)	
14aD-2	High sensitive symmetric response MR sensor using antiphase AC modulation bridge °S. Shirotori, A. Kikitsu, Y. Higashi, Y. Kurosaki, H. Iwasaki (Toshiba)	
14aD-3	Fundamental study on ring interferometric optical probe current sensor with high temperature stability °K. Furuya ¹ , Y. Teraoka ¹ , M. Sonehara ¹ , T. Sato ¹ , T. Kubo ² , M. Miyamoto ² (¹ Shinshu Univ., ² CITIZEN FINEDEVICE)	
14aD-4	Magnetostriction measurement system of magnetic thin films with Fizeau Interferometer °S. Umetsu, Y. Takahashi, N. Inaba (Yamagata Univ.)	
14aD-5	Development of Measurement Technique for Magnetostriction of Magnetics Alloy Ribbons °Y. Endo ¹ , Y. Shimada ² , O. Mori ² , S. Sato ² , R. Utsumi ² (¹ Tohoku Univ., ² Toei Scientific Industrial)	
14aD-6	Characterization of magnetostrictive film on shaft surface in magnetostrictive torque sensor using Kerr effect °K. Ishibashi ^{1,2} , M. Sonehara ¹ , T. Kodaira ² , T. Sasaki ² , T. Sato ¹ (¹ Shinshu Univ., ² Tamagawa)	

Magnetic field • noise	10:45 ~ 12:00	Chair: K. Ishiyama (Tohoku Univ.)
14aD-7	Optimization of Rotation Patterns of Magnetic Field Source with Six Magnets using Covariance Matrix Adaptation Evolution Strategy °H. Sakuma (Utsunomiya Univ.)	
14aD-8	Design of magnetic shield case for small sized AC/DC current sensor by electromagnetic simulation °M. Terao, K. Ogawa, N. Noguchi, K. Takenaka (Yokogawa)	
14aD-9	Magnetic noise characteristics of a wide variety of automobiles °T. Saito, M. Hayashi, J. Wang, K. Sakai, T. Kiwa, K. Tsukada (Okayama Univ.)	
14aD-10	Wide Band Direct On-chip EMI Shielding Layer with Metallic/Magnetic Multilayer °A. Kikitsu ¹ , Y. Kurosaki ¹ , H. Iwasaki ¹ , S. Shirotori ¹ , A. Fujita ² , H. Nishigaki ² , S. Matsunaka ² (¹ Toshiba, ² Shibaura)	
14aD-11	Inductance estimation of MSL with magnetic film using magnetic circuit analysis °T. Mikami, S. Muroga, M. Tanaka (Akita Univ.)	

High frequency measurements	13:00 ~ 14:00	Chair: Y. Endo (Tohoku Univ.)
14pD-1	Construction of high frequency vibration characteristics measurement system of inverse magnetostrictive effect type strain sensor °R. Takano ¹ , S. Hashi ¹ , K. Ishiyama ¹ , T. Hoshi ² (¹ Tohoku Univ., ² Pixie Dust Technologies)	
14pD-2	Simultaneous Measurement of Permeability and Permittivity Using a Microstrip Line-Type Probe °K. Nozawa, S. Takahashi, K. Okita, L. Tonthat, S. Yabukami, M. Sato, S. Sugimoto (Tohoku Univ.)	
14pD-3	Full ac-hysteresis measurements in high frequency magnetic field of several MHz B. Vallet-Simond ^{1,2} , K. Yoshida ¹ , T. Mannen ¹ , T. Isobe ¹ , °H. Yanagihara ¹ (¹ Univ. of Tsukuba, ² Grenoble Alpes University)	
14pD-4	Research on visualization of high-frequency currents in transmission lines °R. Ishida, S. Hashi, K. Ishiyama (Tohoku Univ.)	

Dec. 15/Room A

Symposium "Progresses and emerging frontiers of permanent magnet materials and high-efficiency PM motors"

Chief Organizer: S. Hirose (NIMS)

	9:00 ~ 10:05	Chair: H. Nakamura (ShinEtsu)
	Opening °S. Hirose (NIMS)	
15aA-1	Development of motor design technologies using high performance magnets (30 min.) °Y. Asano ¹ , Y. Sanga ¹ , S. Araki ¹ , M. Nakagawa ¹ , A. Yamagiwa ¹ , S. Morimoto ² , M. Sanada ² , Y. Inoue ² (¹ Daikin, ² Osaka Pref. Univ.)	

15aA-2 Recent advancement of permanent magnet materials developments for vehicle electrification and expectation for future research (30 min.)
°T. Shoji (TOYOTA Motor)

10:15 ~ 11:45

Chair: K. Ozaki (AIST)

15aA-3 Development of high coercivity Nd-Fe-B permanent magnets with improved thermal stability (30 min.)
°H. Sepehri-Amin, J. Li, X. Tang, T. Ohkubo, K. Hono (NIMS)

15aA-4 Computational thermodynamics and microstructure simulations applied to grain boundary engineering in Nd-Fe-B sintered magnet (30 min.)
°T. Koyama¹, T. Abe² (¹Nagoya Univ., ²NIMS)

15aA-5 Determination of constituent phase changes in Nd-Fe-B-Cu sintered magnets on heating and cooling processes by in-situ synchrotron X-ray diffraction
°S. Kobayashi^{1,2}, A. Martin-Cid^{1,2}, T. Abe², S. Hirosawa², M. Suzuki¹, T. Nakamura^{1,2,3}
(¹JASRI/SPring-8, ²ESICMM, ³Tohoku Univ.)

13:30 ~ 15:15

Chair: S. Hirosawa (NIMS)

15pA-1 Development of high performance anisotropic magnetic powders for bonded magnets (45 min.)
°J. Yang (Peking Univ.)

15pA-2 Sm-Fe-N powders and bulks magnets by ultra-low oxygen processes (30 min.)
°K. Takagi, W. Yamaguchi, R. Soda, A. Hosokawa, Y. Hirayama (AIST)

15pA-3 Synthesis of R-TM hard magnetic powder by thermal plasma (30 min.)
°Y. Hirayama (AIST)

Fellow lecture

15:30 ~ 17:30

Chair: S. Nakagawa (Tokyo Inst. Tech.)

15pA-4 Metallic superlattices revisited for spintronics
°K. Takanashi (Tohoku Univ.)

15pA-5 Research on rare earth permanent magnets and magnetic materials: What shall we do from now?
°S. Hirosawa (NIMS)

15pA-6 Research on RF Magnetics
°M. Yamaguchi (Tohoku Univ.)

15pA-7 Fundamentals and applications of artificial magnetic lattices
°M. Inoue (KOSEN, Toyohashi Univ. Tech.)

Dec. 15/Room B

Symposium "Recent applied research of Biomagnetics"

Chief Organizer: K. Kobayashi (Iwate Univ.)

9:15 ~ 10:45

Chair: K. Kobayashi (Iwate Univ.)

15aB-1 Magnetic techniques for diagnosis and treatment of breast cancer (30 min.)
°M. Sekino¹, A. Kuwahata¹, M. Hatano², M. Kusakabe¹ (¹Univ. of Tokyo, ²Tokyo Inst. Tech.)

15aB-2 Highly sensitive diamond quantum magnetometer with large sensor volume (30 min.)
°Y. Masuyama (QST)

15aB-3 Development of a compact ultra-low field MRI system (30 min.)
°D. Oyama¹, N. Tsuyuguchi² (¹Kanazawa Inst. Tech., ²Kindai Univ.)

11:00 ~ 12:00

Chair: K. Kobayashi (Iwate Univ.)

15aB-4 Application of EEG/MEG analytical methods to magnetic nanoparticle imaging (30 min.)
°T. Sasayama, N. Okamura, T. Yoshida (Kyushu Univ.)

15aB-5 Development of heating element and techniques for detecting its temperature and position for hyperthermia (30 min.)
°L. Tonthat¹, K. Mitobe², S. Yabukami¹ (¹Tohoku Univ., ²Akita Univ.)

- Biomagnetism** 13:00 ~ 14:00 Chair: T. Sasayama (Kyushu Univ.)
- 15pB-1 Development of low-noise TMR magnetic sensor for bio-magnetic field measurement
^oK. Fujiwara¹, M. Oogane², S. Kumagai¹, T. Arimoto³, Y. Ando^{1,2} (¹Spin Sensing Factory, ²Tohoku Univ., ³Konica Minolta)
- 15pB-2 An MCG measurement system using TMR sensor array without an MSR
^oT. Nakamura¹, S. Kato¹, M. Kataoka¹, K. Ichimura¹, M. Masuda¹, M. Yuzawa¹, Y. Moriyasu¹, S. Okatake², Y. Ando³
 (¹AKM, ²AsahiKASEI, ³Tohoku Univ.)
- 15pB-3 Consideration of preprocessing of noise reduction method using ICA at low SNR.
^oM. Iwai, K. Miura, M. Abe, T. Hujioaka, K. Kobayashi (Iwate Univ.)
- 15pB-4 Study on sensor plane and analysis space in signal source estimation with spatial filter method for MCG
^oS. Narita¹, M. Iwai¹, W. Sun², K. Kobayashi¹ (¹Iwate Univ., ²Reserch Instisute, National Cerebral and Cardio vascular)

Dec. 15/Room C

- High spin polarization & Topological materials** 9:00 ~ 10:30 Chair: Y. Sakuraba (NIMS)
- 15aC-1 First principles calculations for magnetic multilayers based on Co₂ScAs/Mn₂ScAs
^oK. Fukugasako, H. Itoh, S. Honda (Kansai Univ.)
- 15aC-2 Microstructure and elemental distribution of ultrathin Co₂FeSi/MgO structure
^oE. Matsushita, Y. Takamura, S. Nakagawa (Tokyo Inst. Tech.)
- 15aC-3 L₂₁-atomic order and spin-polarization in Co₂MnZ (Z = Ge, Sn) Heusler thin films
^oV. K. Kushwaha, Y. Sakuraba, T. Nakatani, K. Hono (NIMS)
- 15aC-4 Textured growth and magnetic properties of Co₂FeGa alloy thin films formed by nanocrystals
^oY. Ohno, K. Yamada, M. Shima (Gifu Univ.)
- 15aC-5 Fabrication and characterization of high-quality topological Bi_{1-x}Sb_x thin films
^oY. Hadate, K. Suzuki, H. Asano, K. Ueda (Nagoya Univ.)
- 15aC-6 Topological Weyl semimetal CoSi thin films with spin Hall effect enhanced by *d-p* orbital hybridization
^oK. Tang^{1,2}, Y. C. Lau³, K. Nawa¹, Z. Wen¹, Q. Xiang¹, H. Sukegawa¹, T. Seki³, Y. Miura¹, K. Takanashi³, S. Mitani^{1,2}
 (¹NIMS, ²Univ. of Tsukuba, ³Tohoku Univ.)

- Spin transport phenomena • devices** 10:45 ~ 12:30 Chair: H. Tanigawa (Sony Semiconductor)
- 15aC-7 Micromagnetic analysis for reduction of write current in magnetic nanowire memory element
^oK. Ogura, N. Nakatani, N. Ishii, Y. Miyamoto (NHK STRL)
- 15aC-8 Low Current Driven Vertical Domain Wall Motion Memory with Artificial Ferromagnet
^oY. M. Hung, T. Li, R. Hisatomi, Y. Shiota, T. Moriyama, T. Ono (Kyoto Univ.)
- 15aC-9 Controlling antiferromagnetic skyrmion motion in an angelfish-type racetrack memory by electric field
^oK. Hamada, Y. Nakatani (UEC)
- 15aC-10 Micromagnetic simulation of AFC structure with DMI
^oH. Asakawa, Y. Nakatani (UEC)
- 15aC-11 Static structures and dynamics of frustrated bimerons
^oX. Zhang¹, J. Xia², M. Ezawa³, O. A. Tretiakov⁴, G. Zhao⁵, Y. Zhou², X. Liu¹
 (¹Shinshu Univ., ²The Chinese Univ. of Hong Kong, Shenzhen, ³Univ. of Tokyo, ⁴The Univ. of New South Wales, ⁵Sichuan Normal Univ.)
- 15aC-12 Micromagnetic approach to current-induced domain motion of an elliptical skyrmion produced in perpendicularly magnetized nanowires
^oY. Kaiya¹, S. Honda¹, H. Itoh¹, T. Ohsawa² (¹Kansai Univ., ²Numazu College)
- 15aC-13 Nonreciprocal critical current in a Rashba superconductor
^oY. Miyasaka, R. Kawarazaki, F. Ando, T. Li, J. Ishizuka, R. Hisatomi, Y. Shiota, T. Moriyama, Y. Yanase, T. Ono
 (Kyoto Univ.)

- Magneto resistance effect** 13:00 ~ 14:00 Chair: T. Nakatani (NIMS)
- 15pC-1 Observation and theoretical calculation of voltage-induced large tunnel magnetocapacitance effect
^oK. Ogata¹, Y. Nakayama¹, X. Gang², H. Kaiju^{1,3} (¹Keio Univ., ²Brown Univ., ³Keio Univ. CSRN)

- 15pC-2 Room temperature magnetoresistance effect in $\text{Ni}_{78}\text{Fe}_{22}/\text{Mq}_3$ ($\text{M} = \text{Al}, \text{Er}$)/ $\text{Ni}_{78}\text{Fe}_{22}$ nanoscale junctions
 °K. Senshu¹, Y. Sasaki², Y. Nakayama¹, T. Misawa², T. Komine³, N. Hoshino⁴, T. Akutagawa⁴, M. Fujioka², J. Nishii²,
 H. Kaiju¹ (¹Keio Univ., ²Hokkaido Univ., ³Ibaraki Univ., ⁴Tohoku Univ.)
- 15pC-3 Investigation of negative spin-polarization in $\text{Fe}_x\text{Cr}_{1-x}$ thin films for spin-torque oscillator
 °N. Asam¹, T. Nakatani¹, H. Sepehri-Amin¹, Y. Kota², Y. Sakuraba¹, K. Hono¹ (¹NIMS, ²Fukushima Nat. Coll. Tech.)
- 15pC-4 Computer simulation of AFC effect for small MTJ
 °H. Kimura (UEC)

Tunnel magneto resistance **14:15 ~ 15:15** Chair: H. Sukegawa (NIMS)

- 15pC-5 Detection of NMR signal by TMR based sensors
 °M. Oogane¹, H. Wagatsuma¹, S. Mizukami¹, K. Fujiwara², S. Kumagai², Y. Ando¹ (¹Tohoku Univ., ²Spin Sensing Factory)
- 15pC-6 TMR sensors with amorphous CoFeB/Ta soft magnetic layer
 M. Rasly, °T. Nakatani, J. Li, H. Sepehri-Amin, H. Sukegawa, Y. Sakuraba (NIMS)
- 15pC-7 Thermally assisted STT switching of hybrid memory layer using CoPd/Pd and Co/Pd multilayers
 °W. Zhao¹, T. Kato¹, D. Oshima¹, Y. Sonobe², S. Takahashi², S. Iwata¹ (¹Nagoya Univ., ²Samsung Research Inst. Jpn.)
- 15pC-8 Fabrication of MTJs using FeAlSi epitaxial electrode with low magnetic anisotropy
 °S. Akamatsu, M. Oogane, M. Tsunoda, Y. Ando (Tohoku Univ.)

Dec. 15/Room D

Ferrite **9:00 ~ 10:30** Chair: T. Bitoh (Akita Pref. Univ.)

- 15aD-1 Preparation and magnetic and magneto-optical properties of Zinc Ferrite
 °N. Adachi, Y. Nakata, K. Shinkai (Nagoya Inst. Tech.)
- 15aD-2 High saturation magnetization calcium-zinc spinel ferrite prepared by rapid cooling
 °J. Hashimoto, K. Kakizaki, K. Kamishima (Saitama Univ.)
- 15aD-3 NiZn-substitution effect on magnetic properties of Ca-based γ -class hexagonal ferrite
 °H. Imai, K. Kakizaki, K. Kamishima (Saitama Univ.)
- 15aD-4 Synthesis of LiTi substituted 18H-type hexaferrite
 °H. Takahashi, K. Kakizaki, K. Kamishima (Saitama Univ.)
- 15aD-5 Synthesis of Sr substituted 18H-type hexaferrite
 °H. Kan, K. Kakizaki, K. Kamishima (Saitama Univ.)
- 15aD-6 Magnetic phase diagram of hexagonal ferrite $\text{Ba}(\text{Fe}_{1-x}\text{Sc}_x)_{12}\text{O}_{19}$
 °K. Maruyama¹, S. Tanaka¹, S. Utsumi¹, R. Kiyanagi², A. Nakao³, K. Moriyama³, Y. Ishikawa³
 (¹Tokyo Univ. Sci., Suwa, ²JAEA, ³CROSS)

Soft magnetic materials **10:45 ~ 12:15** Chair: K. Kamishima (Saitama Univ.)

- 15aD-7 Analyses of annealing process of Mn-Zn-Fe-O thin films for magneto-plasmonic effect
 °K. Kuroiwa, Y. Ashizawa, K. Nakagawa (Nihon Univ.)
- 15aD-8 Soft Magnetic Properties of Fe-Si-Al Nano-crystalline Alloys
 °N. Kamiyama¹, T. Matsuoka¹, T. Bitoh² (¹Nippon Chemi-Con, ²Akita Prefect. Univ.)
- 15aD-9 Influence of Heat Treatment on the Magnetostrictive Property of Fe-Co Alloy Single-Crystal Films with bcc Structure
 °T. Akitaya¹, K. Serizawa^{1,2}, M. Ohtake¹, T. Kawai¹, M. Futamoto¹, F. Kirino³, N. Inaba⁴
 (¹Yokohama National Univ., ²Chuo Univ., ³Tokyo Univ. of Arts, ⁴Yamagata Univ.)
- 15aD-10 Magnetic properties of novel soft magnetic composite with magnetic anisotropy
 °T. Suetsuna, H. Kinouchi, N. Sanada (Toshiba)
- 15aD-11 Influence of bias magnetic fields on performance of vibration power generator using Fe-Co based alloy
 °S. Fujieda¹, S. Inoue¹, T. Okada¹, F. Osanai², S. Hashi², K. Ishiyama², S. Seino¹, T. Nakagawa¹, T. Yamamoto¹
 (¹Osaka Univ., ²Tohoku Univ.)
- 15aD-12 Study of vibration power generation using ferromagnetic shape memory alloy
 °K. Ozawa, S. Hashi, K. Ishiyama (Tohoku Univ.)

- Magnetic imaging** 13:00 ~ 14:15 Chair: S. Saito (Tohoku Univ.)
- 15pD-1 Magnetic imaging of domain wall movement of permalloy patterned thin films by alternating magnetic force microscopy and dependence of in-plane magnetic field intensity
°Y. Narita¹, T. Osaka¹, H. Sonobe¹, J. Wu², H. Saito¹ (¹Akita Univ., ²National Changhua Univ.)
- 15pD-2 High-resolution magnetic field energy imaging of magnetic recording heads by using energy cross term of AC and DC magnetic field on alternating magnetic force microscopy
°H. Kon, H. Sonobe, T. Matsumura, H. Saito (Akita Univ.)
- 15pD-3 High resolution detection of zigzag magnetic reversal boundary of perpendicular magnetic recording media film by alternating magnetic force microscopy
°H. Tanaka, S. Wada, T. Matsumura, H. Saito (Akita Univ.)
- 15pD-4 Magnetic domain structure observation of amorphous magnetic wires by spin-polarized low energy electron microscopy
°S. Tatematsu¹, A. Shimode¹, Y. Iwanaga¹, M. Suzuki², Y. Yamauchi² (¹Aichi Steel, ²NIMS)
- 15pD-5 Development of a time-resolved magneto-optical microscope using a semiconductor laser light source
°T. Ogasawara¹, R. Nakamura², A. Yamaguchi² (¹AIST, ²Univ. Hyogo)

Dec. 16/Room A

Symposium "Progresses and emerging frontiers of permanent magnet materials and high-efficiency PM motors"

Chief Organizer: S. Hirose (NIMS)

- 9:00 ~ 10:15** Chair: Y. K. Takahashi (NIMS)
- 16aA-1 Prospects for permanent magnets with non-critical rare earth elements in traction drive motors (45 min.)
°M. J. Kramer, J. Cui, I. Anderson, I. C. Nlebedim (Iowa State Univ.)
- 16aA-2 Enhancement of magnetic anisotropy of L1₀-FeNi nanoparticles and the related compounds for realization of rare-earth free magnet
°S. Goto¹, E. Watanabe¹, Y. Hayashi¹, T. Nishio¹, H. Kura¹, T. Suemasu², H. Yanagihara², E. Kita², T. Honda³, K. Ito⁴,
Y. Shimada⁴, M. Tsujikawa⁴, M. Mizuguchi⁴, M. Shirai⁴, T. Konno⁴, K. Takanashi⁴
(¹DENSO, ²Univ. of Tsukuba, ³KEK, ⁴Tohoku Univ.)
- 10:30 ~ 12:00** Chair: A. Hosokawa (AIST)
- 16aA-3 Prospect of 1-12 based permanent magnets (30 min.)
°Y. K. Takahashi¹, D. Ogawa¹, H. Sepehri-Amin¹, T. Shima², T. Ohkubo¹, S. Hirose¹ (¹NIMS, ²Tohoku Gakuin Univ.)
- 16aA-4 First-principles Study of Thermodynamic Stability in Multi-elements Alloying (Sm,X)(Fe,Y)₁₂Z Compounds
°A. Saengdeejing, Y. Chen (Tohoku Univ.)
- 16aA-5 Chemical Synthesis of (Sm,Zr)(Fe,Co,Ti)₁₂ Magnetic Mesoscopic Particles
°T. Trinh, R. Sato, T. Teranishi (Kyoto Univ.)
- 13:30 ~ 15:00** Chair: T. Ohkubo (NIMS)
- 16pA-1 Atomistic study of thermally-activated magnetization processes in rare earth permanent magnets (30 min.)
°S. Miyashita^{1,2}, M. Nishino², Y. Toga^{1,2}, T. Hinokihara^{1,2}, T. Miyake^{2,3}, H. Akai^{1,2}, S. Hirose², A. Sakuma⁴
(¹Univ. of Tokyo, ²NIMS, ³AIST, ⁴Tohoku Univ.)
- 16pA-2 The effect of the surface magnetic anisotropy of Nd atoms on the coercivity in Nd-Fe-B magnets
°M. Nishino¹, I. E. Uysal¹, S. Miyashita^{1,2} (¹NIMS, ²Univ. of Tokyo)
- 16pA-3 Observation of the demagnetization process of HDDR Nd-Fe-B sintered magnets by soft X-ray magnetic circular dichroism microscopy
°A. Martin-Cid^{1,2}, T. Kawahara³, S. Kobayashi^{1,2}, K. Toyoki^{1,2}, D. Billington^{1,2}, Y. Kotani¹, H. Kubo³, Y. Une³, T. Iriyama³,
M. Sagawa³, T. Nakamura^{1,2,4} (¹JASRI, ²ESICMM, ³Daido Steel, ⁴Tohoku Univ.)
- 15:15 ~ 16:30** Chair: H. Sepehri-Amin (NIMS)
- 16pA-4 Hysteresis design of magnetic materials for efficient energy conversion (45 min.)
°O. Gutfleisch (Tech. Univ. Darmstadt)

- 16pA-5 Visualization of the magnetization reversal processes in He jet-milled Nd-Fe-B sintered magnet by X-ray magnetic tomography
 °M. Suzuki¹, M. Takeuchi², S. Kobayashi^{1,3}, R. Haga², Y. Kotani¹, T. Nakamura^{1,3,4}, N. Kikuchi², T. Sasaki^{3,5}, T. Ohkubo^{3,5}, Y. Une⁶, S. Okamoto^{2,3} (¹JASRI/SPring-8, ²Tohoku Univ., ³ESICMM, ⁴SRIS, Tohoku Univ., ⁵NIMS, ⁶Daido Steel)

- IEEE DL lecture** **17:00 ~ 18:00** Chair: S. Nakagawa (Tokyo Inst. Tech.)
 16pA-6 Spins in Low-dimensional Materials Systems: Transport, Gate-control and Conversion
 °M. Shiraishi (Kyoto Univ.)

Dec. 16/Room B

Symposium "Physics and Applications of Spin Ensemble Hierarchy"

Chief Organizer: S. Fukami (Tohoku Univ.)

- 9:15 ~ 10:15** Chair: S. Fukami (Tohoku Univ.)
 16aB-1 Strong-coupling phenomena in spintronics (30 min.)
 °G. E. Bauer (Tohoku Univ.)

- 16aB-2 Probabilistic Computing with Stochastic Magnetic Tunnel Junctions (30 min.)
 °K. Camsari^{1,3}, W. A. Borders², A. Z. Pervaiz¹, S. Fukami², S. Datta¹, H. Ohno²
 (¹Purdue Univ., ²Tohoku Univ., ³Univ. of California)

- 10:30 ~ 11:30** Chair: S. Fukami (Tohoku Univ.)
 16aB-3 Logic operation using electron spins in silicon (30 min.)
 °Y. Ando, M. Shiraishi (Kyoto Univ.)

- 16aB-4 Reservoir computing using dynamic of magnetic skyrmions (30 min.)
 °T. Yokouchi (RIKEN, Univ. of Tokyo)

- 13:00 ~ 14:00** Chair: M. Shiraishi (Kyoto Univ.)
 16pB-1 Development of Domain Wall Type Spin Memristor toward Analogue Neuromorphic Computing (30 min.)
 °T. Shibata, T. Shinohara, T. Ashida, M. Ohta, K. Ito, S. Yamada, Y. Terasaki, T. Sasaki (TDK)

- 16pB-2 Strong magnon-magnon coupling in synthetic antiferromagnets (30 min.)
 °Y. Shiota¹, T. Taniguchi², M. Ishibashi¹, T. Moriyama¹, T. Ono^{1,3} (¹Kyoto Univ., ²AIST, ³CSRN, Osaka Univ.)

- 14:15 ~ 15:15** Chair: M. Shiraishi (Kyoto Univ.)
 16pB-3 Measurement and control of spin quantum states utilizing semiconductor quantum dots (30 min.)
 °T. Otsuka¹, T. Nakajima², M. R. Delbecq², P. Stano^{2,3}, S. Amaha², J. Yoneda², K. Takeda², G. Allison², S. Li², A. Noiri², T. Ito², D. Loss^{2,4}, A. Ludwig⁵, A. D. Wieck⁵
 (¹Tohoku Univ., ²RIKEN, ³Slovak Academy of Sciences, ⁴Univ. of Basel, ⁵Ruhr-Universität Bochum)

- 16pB-4 Majorana fermions and non-Abelian anyons in a Kitaev quantum spin liquid (30 min.)
 °Y. Kasahara (Kyoto Univ.)

Spin-wave • Ferromagnetic Resonance **15:30 ~ 16:45** Chair: M. Oogane (Tohoku Univ.)

- 16pB-5 Self-induced inverse spin-Hall effect in Co-Fe alloy single-layer films under the ferromagnetic resonance
 °S. Baek¹, Y. Teki², E. Shikoh¹ (¹Osaka City Univ. Eng., ²Osaka City Univ. Sci.)

- 16pB-6 Magnetization dynamics induced by slot line waveguide and detection of spin waves in yttrium iron garnet
 °T. Koda¹, S. Muroga², Y. Endo³ (¹Oshima Nat. Coll. Tech., ²Akita Univ., ³Tohoku Univ.)

- 16pB-7 Propagation properties of spin wave in magnonic crystal with quasi periodic structure
 °K. Fujii, K. Kasahara, T. Manago (Fukuoka Univ.)

- 16pB-8 Spin Wave Resonance in Perpendicularly Magnetized Synthetic Antiferromagnets
 °M. Ishibashi, Y. Shiota, S. Funada, T. Moriyama, T. Ono (ICR, Kyoto Univ.)

- 16pB-9 Co-planar waveguide ferromagnetic resonance of Co/Pt multilayers
 °S. Tomita, N. Kikuchi, M. Hatayama, S. Okamoto (Tohoku Univ.)

Dec. 16/Room C

Medical application of magnetic beads

9:30 ~ 10:30

Chair: S. Seino (Osaka Univ.)

- 16aC-1 Evaluation of magnetic relaxations of magnetic nanoparticles depended on particle structure
°S. Ota¹, R. Miyazawa¹, D. Nagata², M. Futagawa¹, Y. Takemura² (¹Shizuoka Univ., ²Yokohama National Univ.)
- 16aC-2 Evaluation of magnetocrystalline anisotropy of oriented ferromagnetic single crystal nanocube in copper matrix
°S. Kobayashi¹, T. Yamaminami¹, H. Sakakura¹, M. Takeda¹, T. Yamada¹, H. Sakuma², S. B. Trisnanto¹, S. Ota³, Y. Takemura¹
(¹Yokohama National Univ., ²Utsunomiya Univ., ³Shizuoka Univ.)
- 16aC-3 Development of Discrimination Method of Mobile and Immobilized Magnetic nanoparticle samples in 3D Magnetic Particle Imaging.
°Y. Noguchi, T. Yoshida (Kyushu Univ.)
- 16aC-4 T_2 relaxation of functional Co-Mg ferrite NPs for theranostics
°S. Hamada¹, N. Sakai¹, K. Aoki¹, K. Kodama¹, K. Nashimoto¹, Y. Hosokai³, A. Usui⁴, Y. Ichiyanagi^{1,2}
(¹Yokohama National Univ., ²Osaka Univ., ³Inter. Univ. of Health&Welfare, ⁴Tohoku Univ.)

Hyperthermia

10:45 ~ 12:00

Chair: T. Yoshida (Kyushu Univ.)

- 16aC-5 Heat dissipation of magnetically fractionated Ferucarbotran
°M. Ishikawa¹, S. Ota², T. Suko Bagus¹, T. Yamada¹, T. Yoshida³, Y. Takemura¹
(¹Yokohama National Univ., ²Shizuoka Univ., ³Kyushu Univ.)
- 16aC-6 DC/AC magnetization characteristics and heat generation characteristics of Magnetic vortex nanorings
°E. Sasaoka¹, S. B. Trisnanto¹, T. Yamada¹, J. Wu², Y. Cheng², S. Ota³, Y. Takemura¹
(¹Yokohama National Univ., ²Tongji Univ., ³Shizuoka Univ.)
- 16aC-7 Heat dissipation of magnetic nanoparticles and the AC susceptibility of their linear and nonlinear responses
°T. Yamaminami¹, S. B. Trisnanto¹, T. Yamada¹, S. Ota², Y. Takemura¹ (¹Yokohama National Univ., ²Shizuoka Univ.)
- 16aC-8 Dynamic Hysteresis Measurement of Magnetic Nanoparticle Suspensions in Parallel and Perpendicular DC Magnetic Fields
°R. Onodera¹, E. Kita^{1,2}, M. Kishimoto², T. Kuroiwa², H. Yanagihara² (¹Ibaraki Nat. Coll. Tech, ²Univ. of Tsukuba)
- 16aC-9 Distribution of magnetic and electric fields in magnetic circuit type field generator for magnetic hyperthermia
°S. Nakamura, S. Fujieda, S. Seino, T. Nakagawa, T. Yamamoto (Osaka Univ.)

Symposium "Frontier of magnetic domain structure analysis by data science"

Chief Organizer: C. Mitsumata (NIMS)

13:00 ~ 14:30

Chair: C. Mitsumata (NIMS)

- 16pC-1 Automated characterization of magnetic materials (30 min.)
°K. Ono (KEK)
- 16pC-2 Adaptive design of experiments for X-ray magnetic circular dichroism spectroscopy (30 min.)
°T. Ueno (QST)
- 16pC-3 Coercivity Analysis based on extended Landau free energy landscape (30 min.)
°M. Kotsugi (Tokyo Univ. Sci.)

14:45 ~ 15:45

Chair: C. Mitsumata (NIMS)

- 16pC-4 Drawing the extended Landau free energy landscape of polycrystalline magnetic thin films (30 min.)
°A. L. Foggiatto¹, S. Kunii¹, C. Mitsumata², M. Kotsugi¹ (¹Tokyo Univ. Sci., ²NIMS)
- 16pC-5 Precision improvement in electron holography: application of information science to magnetic structure analysis (30 min.)
°Y. Murakami¹, T. Tanigaki², H. Shinada², Y. Midoh³ (¹Kyushu Univ., ²Hitachi, ³Osaka Univ.)

Dec. 17/Room A

Magnetic properties

9:15 ~ 10:30

Chair: R. Umetsu (Tohoku Univ.)

- 17aA-1 Ferrimagnetism of $\text{Li}_x\text{Mn}_2\text{O}_4$ cathode material studied by magnetic Compton scattering
°K. Suzuki¹, H. Hafiz^{2,3}, B. Barbiellini^{3,4}, Y. Orikasa⁵, S. Kaprzyk^{3,6}, N. Tsuji⁷, K. Yamamoto⁸,
K. Hoshi¹, Y. Uchimoto⁸, Y. Sakurai⁷, A. Bansil³, H. Sakurai¹
(¹Gumma Univ., ²Carnegie Mellon Univ., ³Northeastern Univ., ⁴LUT Univ., ⁵Ritsumeikan Univ.,
⁶AGH Univ. of Sci. and Tech., ⁷JASRI/SPring-8, ⁸Kyoto Univ.)
- 17aA-2 Magnetic field dependence of XMCD in CoFeB / MgO multilayer films
°H. Ito¹, M. Suzuki¹, M. Takahashi¹, K. Suzuki¹, K. Hoshi¹, K. Amemiya², H. Sakurai¹ (¹Gumma Univ., ²KEK)
- 17aA-3 Magnetic field dependence of magnetic Compton profile of Fe / Co multilayer films
°R. Shioda¹, H. Ito¹, K. Suzuki¹, K. Hoshi¹, S. Ishii¹, N. Tsuji², H. Sakurai¹ (¹Gumma Univ., ²JASRI/SPring-8)
- 17aA-4 Growth and magnetic properties of non-collinear magnetic $\text{Mn}_3\text{Ni}_{1-x}\text{Cu}_x\text{N}$ films
°R. Miki¹, T. Hajiri¹, Z. Kan², C. Hua³, G. Philipp², H. Asano¹ (¹Nagoya Univ., ²Augsburg Univ., ³Colorado State Univ.)
- 17aA-5 Magnetic properties of layered copper and cobalt cinnamate complexes
°K. Ichimura¹, T. Fujihara¹, T. Kida², M. Hagiwara², N. Kamata¹, Z. Honda¹ (¹Saitama Univ., ²Osaka Univ.)

Spin caloritronics

10:45 ~ 12:00

Chair: T. Kimura (Kyushu Univ.)

- 17aA-6 Elucidation of the correlation between microstructure and spin Seebeck voltage in films composed of YIG nanocrystals
°S. Masaki¹, M. Yamamoto¹, K. Kondo¹, K. Yamada¹, Y. Kurokawa², Y. Shiota³, T. Moriyama³, T. Ono³, H. Yuasa², M. Shima¹
(¹Gifu Univ., ²Kyushu Univ., ³Kyoto Univ.)
- 17aA-7 Temperature difference dependence of coercive force of spin Seebeck effect in Bi:YIG/Pt
°Y. Takahashi, T. Takase, K. Yamaguchi (Fukushima Univ.)
- 17aA-8 Observation of spin-thermoelectric conversion using Fe-oxide nanoparticle assembled film
°Y. Kurokawa, Y. Hamada, H. Yuasa (Kyushu Univ.)
- 17aA-9 Large spin Hall effect in non-equilibrium Cu-based alloys
°H. Masuda¹, R. Modak², T. Seki^{1,2}, K. Uchida^{1,2}, Y. Lau¹, Y. Sakuraba^{2,3}, R. Iguchi², K. Takanashi¹
(¹Tohoku Univ., ²NIMS, ³JST-PREST)
- 17aA-10 Observation of spin-polarized Weyl cones and giant anomalous Nernst effect in Co_2MnGa films
°K. Sumida¹, Y. Sakuraba², K. Masuda², T. Kono³, M. Kakoki³, K. Goto², W. Zhou², K. Miyamoto³, Y. Miura², T. Okuda³,
A. Kimura³ (¹JAEA, ²NIMS, ³Hiroshima Univ.)

Magnetic Anisotropy

13:00 ~ 14:00

Chair: K. Suzuki (Gunma Univ.)

- 17pA-1 Magnetic characteristics and Mössbauer effect of $\text{Fe}_{2-x}\text{MnGa}_{1+x}$ ($x = 0 \sim 0.5$) alloys
°Y. Miura, T. Shima, M. Doi (Tohoku Gakuin Univ.)
- 17pA-2 First-principles evaluation of 2-site-type magnetic anisotropy in metal magnetic materials
°Y. Kota¹, Y. Toga², D. Miura³, A. Sakuma³ (¹Fukushima Nat. Coll. Tech., ²The Univ. of Tokyo, ³Tohoku Univ.)
- 17pA-3 Easy-cone anisotropy in tetragonal spinel NiCo_2O_4 film
°H. Koizumi, H. Yanagihara (Univ. of Tsukuba)
- 17pA-4 Quantitative analysis of intrinsic uniaxial anisotropy of tilt-oriented magnetic film
°D. Miyazaki¹, I. Tagawa¹, N. Honda¹, S. Saito² (¹Tohoku Inst. Tech., ²Tohoku Univ.)

Multiferroics

14:15 ~ 15:15

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

- 17pA-5 Development of BiFeO_3 based thin film materials with perpendicular anisotropy and large saturation magnetization for application to magnetization reversal of multiferroic / metallic magnetic laminated film by applying electric field
°S. Yoshimura, D. Yamamoto, K. Takeda, T. Ozeki, G. Egawa (Akita Univ.)
- 17pA-6 Electric-field modulation of anisotropic magnetoresistance effect in $\text{Co}_2\text{FeSi}/\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})-\text{PbTiO}_3$ heterostructures
°T. Usami¹, S. Fujii¹, S. Yamada^{1,2}, Y. Shiratsuchi^{2,3}, R. Nakatani^{2,3}, K. Hamaya^{1,2}
(¹Grad. Sch. Eng. Sci., Osaka Univ., ²CSRN, Osaka Univ., ³Grad. Sch. Eng., Osaka Univ.)

- 17pA-7 Voltage-controlled, strain-mediated magnetic domains in a multiferroic heterostructure having interfacial perpendicular magnetic anisotropy
 °S. Pati¹, I. Suzuki², S. Sugimoto², T. Taniyama¹ (¹Nagoya Univ., ²NIMS)
- 17pA-8 Magnetotransport properties of a Fe₃Si/Pb(Mg_{1/3}Nb_{2/3})-PbTiO₃ interfacial multiferroic heterostructure
 °S. Fujii¹, T. Usami¹, S. Yamada^{1,2}, Y. Shiratsuchi^{2,3}, R. Nakatani^{2,3}, K. Hamaya^{1,2}
 (¹Grad. Sch. Eng. Sci., Osaka Univ., ²CSRN, Osaka Univ., ³Grad. Sch. Eng., Osaka Univ.)

Magneto-optical effect **15:30 ~ 16:30** Chair: Y. Shiota (Kyoto Univ.)

- 17pA-9 Prediction of free energy in ferromagnetic shape memory alloy by using topological data analysis
 °R. Seni, A. L. Foggiatto, M. Kotsugi (Tokyo Univ. Sci.)
- 17pA-10 Drawing of Extended-Landau free energy in magnetic reversal process using Topological data analysis
 °S. Kunii¹, F. L. Alexandre¹, C. Mitsumata², M. Kotsugi¹ (¹Tokyo Univ. Sci., ²NIMS)
- 17pA-11 Characterization of local structure in cobalt ferrite thin films by magneto-optical spectroscopy
 °S. Wang, M. Nishikawa, T. Ishibashi (Nagaoka Univ. Tech.)
- 17pA-12 FDTD simulation of the Faraday effect on nanowire Ag/Bi:YIG composite structure
 °S. Ilham¹, K. Takada¹, A. Nanda¹, S. Mito², T. Goto¹, Y. Nakamura¹, P. Lim¹, M. Inoue³, H. Uchida¹
 (¹Toyohashi Univ. Tech., ²Tokyo Nat. Coll. Tech., ³National Institute of Technology)

Dec. 17/Room B

Ordered Alloy Films **9:00 ~ 10:30** Chair: T. Hasegawa (Akita Univ.)

- 17aB-1 Fabrication of L1₀-ordered CoPt with high coercivity of 15 kOe on Si substrates by hydrogen annealing
 °R. Toyama¹, S. Kawachi^{2,3}, J. Yamaura^{2,3}, Y. Murakami^{2,3}, H. Hosono², Y. Majima^{1,2}
 (¹MSL, Tokyo Tech, ²MCES, Tokyo Tech, ³IMSS, KEK)
- 17aB-2 Fabrication of Cu under layer and L1₀-FeNi by using Pulsed Laser Deposition system
 °T. Nakao, T. Miyashita, T. Kumagai, H. Saito, D. Furuya, M. Kotsugi (Tokyo Univ. Sci.)
- 17aB-3 Investigation of fabrication and magnetic property of hexagonal-FeNi multilayer films
 °T. Miyashita, H. Saito, T. Nakao, T. Kumagai, D. Furuya, M. Kotsugi (Tokyo Univ. Sci.)
- 17aB-4 Structure Analysis of Epitaxial Mn-Ge Alloy Thin Films Formed on Cr(001) Underlayers
 °S. Noro¹, N. Kotaro¹, M. Ohtake¹, M. Futamoto¹, T. Kawai¹, F. Kirino², N. Inaba³
 (¹Yokohama National Univ., ²Tokyo Univ. of Arts, ³Yamagata Univ.)
- 17aB-5 Dependence of fabrication method on magnetic properties of Mn_xFe_yGa thin films
 °S. Katayama, S. Watanabe, R. Mineta, T. Shima, M. Doi (Tohoku Gakuin Univ.)
- 17aB-6 Fabrication of C11_b-type Cr₂Al(001) thin film
 °S. Hamaguchi, K. Toyoki, Y. Shiratsuchi, R. Nakatani (Osaka Univ.)

Multilayer • Interfacial magnetism **10:45 ~ 12:00** Chair: T. Seki (Tohoku Univ.)

- 17aB-7 Electric field effect of magnetic anisotropy and damping constant in MgO/Co/Pt trilayers
 °A. Sakoguchi¹, D. Oshima¹, S. Iwata², T. Kato¹ (¹Nagoya Univ., ²NISRI)
- 17aB-8 Enhancement of DMI on Multi-layer FeCo/Pt/CoNi
 °K. Ohara, X. Liu (Shinshu Univ.)
- 17aB-9 Fabrication of [Fe/Co/Ni]_n thin films and optimization of temperature
 °H. Saito, T. Miyashita, T. Kumagai, T. Nakao, D. Furuya, M. Kotsugi (Tokyo Univ. Sci.)
- 17aB-10 Perpendicular magnetic anisotropy of Fe/cubic CrO/MgO heterostructures
 °Y. Iida^{1,2}, Q. Xiang², T. Scheike², Z. Wen², J. Okabayashi³, T. Ohkubo², K. Hono^{1,2}, H. Sukegawa², S. Mitani^{1,2}
 (¹Univ. of Tsukuba, ²NIMS, ³Univ. of Tokyo)
- 17aB-11 Perpendicular magnetic anisotropy induced by Rashba-type spin-orbit coupling in Fe/Au
 °J. Okabayashi¹, S. Li², S. Sakai², T. Mitsui², Y. Kobayashi³, K. Tanaka⁴, S. Mitani⁵
 (¹Univ. of Tokyo, ²QST, ³Kyoto Univ., ⁴IMS, ⁵NIMS)

Compounds • Granular Films **13:00 ~ 14:15** Chair: T. Ogawa (Tohoku Univ.)

- 17pB-1 Relationship between deposition condition and film structure of Si₃N₄-added Fe thin films
°N. Miura¹, F. Kirino², Y. Narita¹, N. Inaba¹, Y. Takahashi¹ (¹Yamagata Univ., ²Tokyo Univ. of Arts)
- 17pB-2 Twisted spin structure at the interface of bilayers having different magnetic anisotropy
°H. Onoda¹, K. Amemiya², H. Yanagihara¹ (¹Univ. of Tsukuba, ²KEK)
- 17pB-3 Magnetic properties of monolayer graphene annealed in hydrogen atmosphere
°R. Sonoda¹, K. Kimura¹, Y. Fujiwara¹, T. Kobayashi¹, M. Jimbo² (¹Mie Univ., ²Daido Univ.)
- 17pB-4 Material investigation of granular thin films suitable for magneto-optical imaging
°A. Kitahara¹, R. Hashimoto², T. Goto¹, Y. Nakamura¹, P. Lim¹, M. Inoue³, H. Uchida¹
(¹Toyohashi Univ. Tech., ²Suzuka Nat. Coll. Tech., ³National Institute of Technology)
- 17pB-5 Development of strain sensor with granular film
°T. Uwabe¹, Y. Fujiwara¹, D. Oshima², T. Kato², M. Jimbo³, S. Iwata² (¹Mie Univ., ²Nagoya Univ., ³Daido Univ.)

Amorphous • Nano-crystal Films **14:30 ~ 15:45** Chair: T. Kato (Nagoya Univ.)

- 17pB-6 Change in saturation magnetostriction and damping constant of X/Co-Fe-B thin films with thickness
°H. Tanaka, T. Miyazaki, S. Hashi, Y. Endo (Tohoku Univ.)
- 17pB-7 Dependence of Structure and Magnetic Properties on the B Composition for (Fe_{0.75}Ga_{0.25})_{100-x}B_x Films
°Y. Endo, Y. Kawabe, S. Muramatsu, T. Miyazaki (Tohoku Univ.)
- 17pB-8 Study on the structure and static and dynamic magnetic properties of Fe-Ga-B thin films with various Ga composition
°S. Muramatsu, T. Miyazaki, Y. Endo (Tohoku Univ.)
- 17pB-9 Study of magnetic properties of amorphous Fe-B soft magnetic particles
°K. Murata, T. Miyazaki, H. Masumoto, Y. Endo (Tohoku Univ.)
- 17pB-10 Structure of MnPt alloy produced by the quench solidification method
°N. Era¹, H. Sato¹, I. Sasaki¹, S. Iikubo¹, T. Tokunaga¹, T. Ogawa² (¹Kyushu Inst. Tech., ²MERI-FITC)

Nanoparticles **16:00 ~ 17:15** Chair: S. Tomita (Tohoku Univ.)

- 17pB-11 Synthesis of α''-(Fe, M)₁₆N₂ nanoparticles obtained by hydrogen reduction and subsequent nitrogenation starting from α-(Fe, M)OOH (M= Al, Co)
°M. Tobise, S. Saito (Tohoku Univ.)
- 17pB-12 Synthesis of Fe-Fe₃O₄ coagulated nanoparticle assembly with different nanoparticle diameter
T. Ogawa, °N. Kosaka, Y. Yamaguchi, S. Saito (Tohoku Univ.)
- 17pB-13 Synthesis and magnetic properties of needle shaped Fe₃O₄/MnFe₂O₄/CoFe₂O₄ nanoparticles
°S. Yamada, M. Kishimoto, H. Yanagihara (Univ. of Tsukuba)
- 17pB-14 Synthesis and measurements of magnetic properties of needle-shaped nanoparticles of CoFe₂O₄ and MnFe₂O₄ by substitution reaction
°D. Hirose, S. Yamada, M. Kishimoto, H. Yanagihara (Univ. of Tsukuba)
- 17pB-15 Magnetization analysis of hollow Fe₃O₄ particles by polarized small angle neutron scattering
°E. Nomura¹, S. Matuo¹, S. Kobayashi¹, J. Manjanna², Y. Kawamura³, J. Suzuki³, K. Ooishi³, K. Hiroi⁴
(¹Iwate Univ., ²Rani Channamma Univ., ³CROSS, ⁴JAEA)

Dec. 17/Room C

Magnetic recording media **9:00 ~ 10:15** Chair: H. Suto (Toshiba)

- 17aC-1 Structure and magnetic properties of FePt granular film precipitated in two phases by grain boundary materials with various melting points (1)
°T. Saito¹, K. Tham², R. Kushibiki², T. Ogawa¹, S. Saito¹ (¹Tohoku Univ., ²TANAKA)
- 17aC-2 Structure and magnetic properties of FePt granular film precipitated in two phases by grain boundary materials with various melting points (2)
°T. Saito¹, K. Tham², R. Kushibiki², T. Ogawa¹, S. Saito¹ (¹Tohoku Univ., ²TANAKA)
- 17aC-3 Investigation of origin and suppression to variation of composition ratio in L1₀-FePt fabrication process
°K. Komatsuda, A. Tsukamoto (Nihon Univ.)

17aC-4 Lattice mismatch effect on the microstructure of FePt based granular films
°I. Suzuki, Y. K. Takahashi, K. Hono (NIMS)

17aC-5 Reduction of switching field distribution and surface roughness for full granular stacked perpendicular recording media by utilizing cap layer consisting of ferromagnetic grain boundary
°K. Tham¹, R. Kushibiki¹, T. Kamada¹, S. Saito² (¹TANAKA, ²Tohoku Univ.)

Assisted recording • Magnetic head

10:30 ~ 11:45

Chair: T. Nagasawa (Toshiba)

17aC-6 Dot dispersion Conditions for Achieving High Recording Density in HD MR
°N. Matsushima, F. Akagi (Kogakuin Univ.)

17aC-7 Heat-Assisted Magnetic Recording on Dual Structure Bit Patterned Media
°H. Yamane, S. J. Greaves, Y. Tanaka (Tohoku Univ.)

17aC-8 Field angle effect on microwave assisted magnetization switching
°N. Kikuchi, S. Okamoto (Tohoku Univ.)

17aC-9 Withdrawn

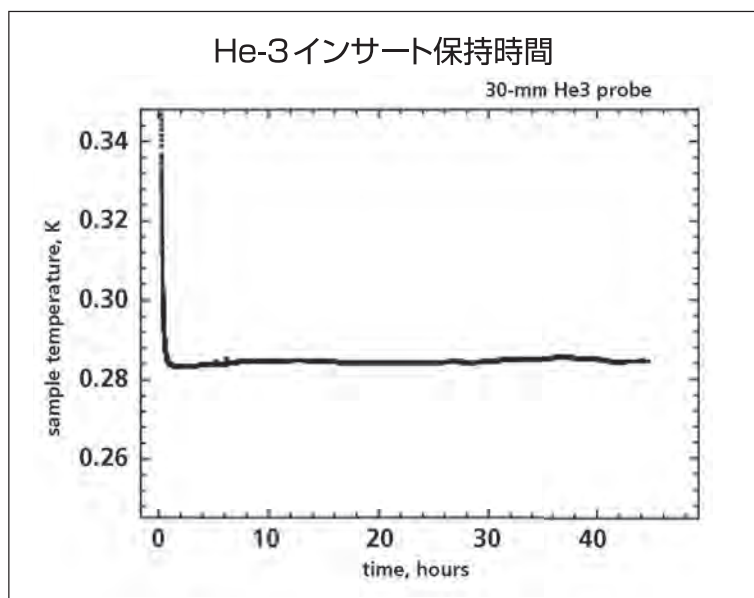
17aC-10 Nano-beam XMCD study on magnetization dynamics of an HDD write head
°H. Suto¹, A. Kikitsu¹, Y. Kotani², T. Maeda¹, K. Toyoki², H. Osawa², N. Kikuchi³, S. Okamoto³, T. Nakamura²
(¹Toshiba R&D Center, ²JASRI, ³Tohoku Univ.)

CFM-iVTI 無冷媒超伝導マグネットシステム



仕様

- 磁場強度：±5T～±18T
- 磁場均一度：
磁場中心φ10mm球内で0.1%(標準)
- サンプル冷却方法：
熱交換ガスフロー(アクティブガス)
又は静的熱交換ガス(スタティックガス)
- サンプル温度：
1.5K～375K(アクティブガス)
1.8K～375K(スタティックガス)
- VTI内径：30mm又は50mm
- 自動制御ニードルバルブ



自動制御機能

- 磁場制御
- サンプル温度制御
- 熱交換ガス流量制御

オプション

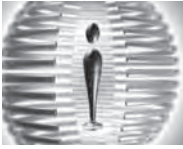
- He-3インサート
(300mK～300K)
- 700K 高温インサート
- サンプル回転機構

日本代理店 <http://www.naccjp.com> nacc-c@naccjp.com



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New 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



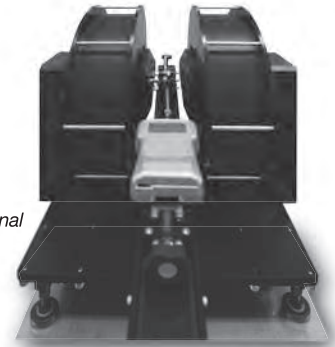
The magnetostriction measuring equipment

Under Development!

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

Features

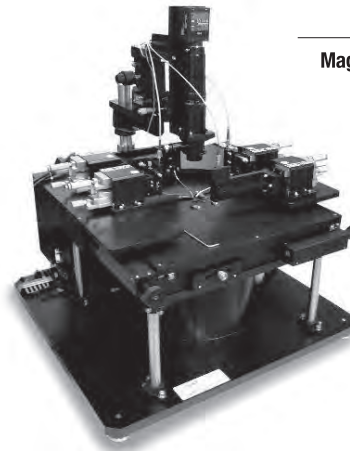
- Provide higher accuracy and resolution than the conventional strain gauge method equipment.



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Longitudinal and Perpendicular Magnetic Field Prober



Main Products

- Magneto-resistance measurement system
- TMR measurement system
- Full-automatic prober
- Semi-automatic prober
- Manual prober
- Probe card

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, Bitter magnet, Variable gap magnet, Coils for optical research and others.

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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。

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・本体2,800円

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日本磁気学会『令和元年度出版賞』受賞
三俣千春著……………236頁・本体3,400円

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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・本体3,800円

④ スピントロニクス —応用編—

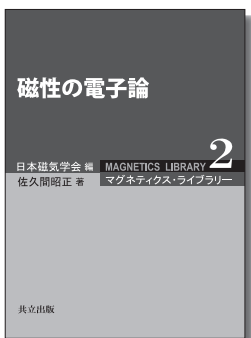
鈴木義茂・湯浅新治・久保田 均著……………続 刊

⑤ パワーマグネティクスのための応用電磁気学

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【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として編纂。

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—

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深道和明著……………344頁・本体5,000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。

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・本体2,500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-位相—

富田知志・澤田 桂著……………224頁・本体2,500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

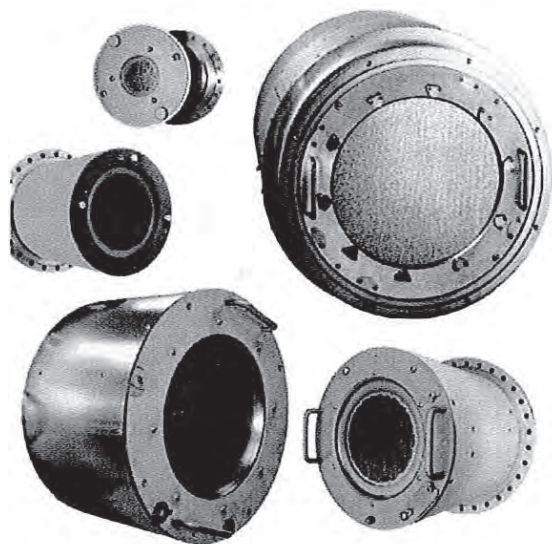
マテリアルズインフォマティクス

小野寛太他著……………続 刊

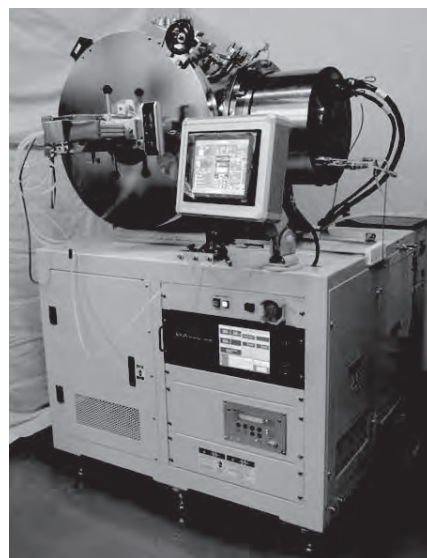
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世界初! 高温超電導型VSM

新製品

TOEI

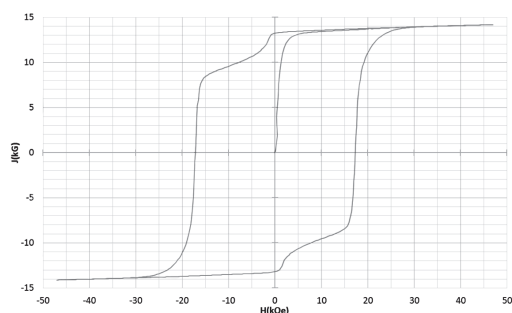
世界初*、高温超電導マグネットをVSMに採用することで
測定速度 当社従来機 1/20 を実現。

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

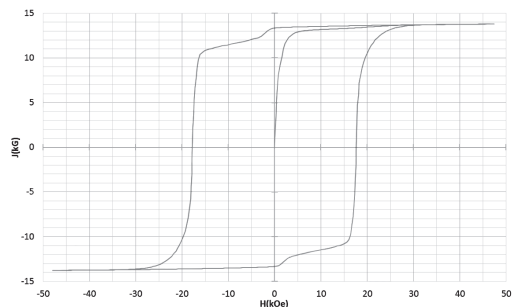
高温超電導VSMによるNdFeB(sint.) 0.5 mm cube BHカーブ



磁化測定レンジ: 0.2 emu

Br = 13.2 kG HcJ = 17.2 kOe

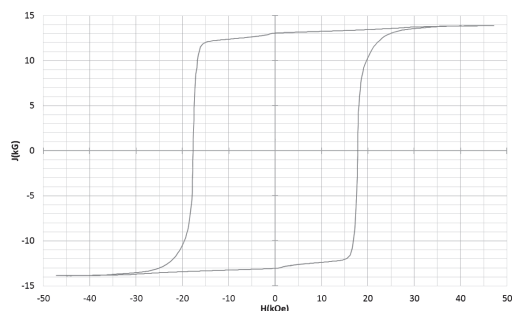
高温超電導VSMによるNdFeB(sint.) 1 mm cube BHカーブ



磁化測定レンジ: 2 emu

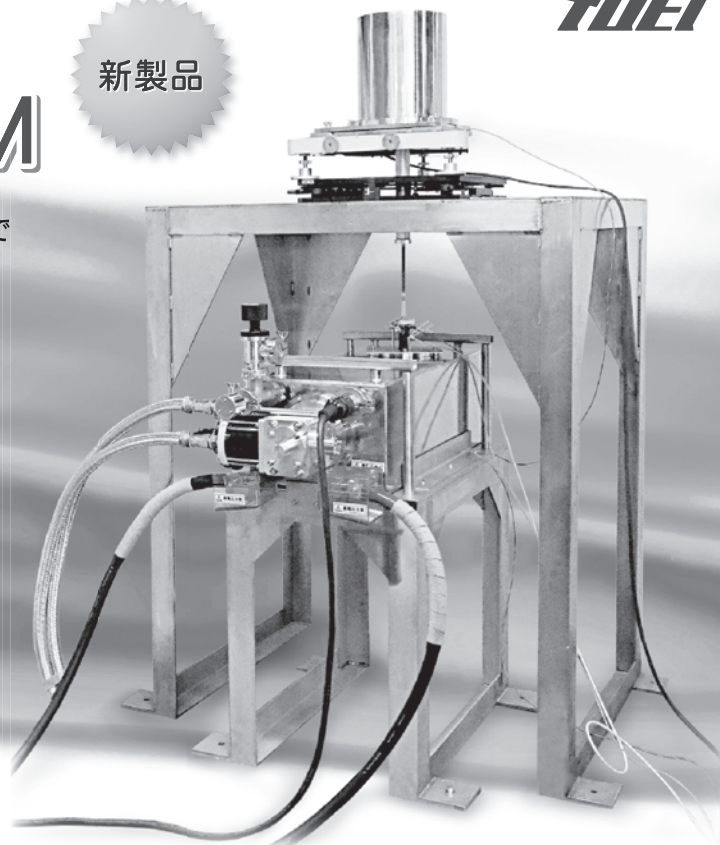
Br = 13.3 kG HcJ = 17.7 kOe

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



磁化測定レンジ: 100 emu

Br = 13.1 kG HcJ = 17.8 kOe



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 = 5 Tesla, 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

TOEI 東英工業株式会社

<http://www.toeikogyo.co.jp>

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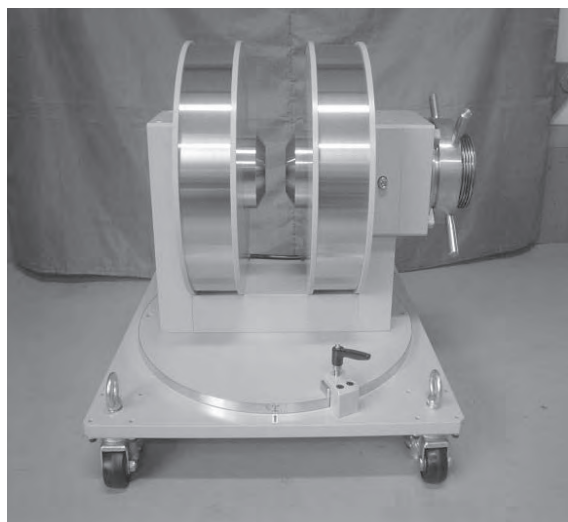
TEL: 042-791-1211 FAX: 042-792-0490

E-mail: sales@toeikogyo.co.jp

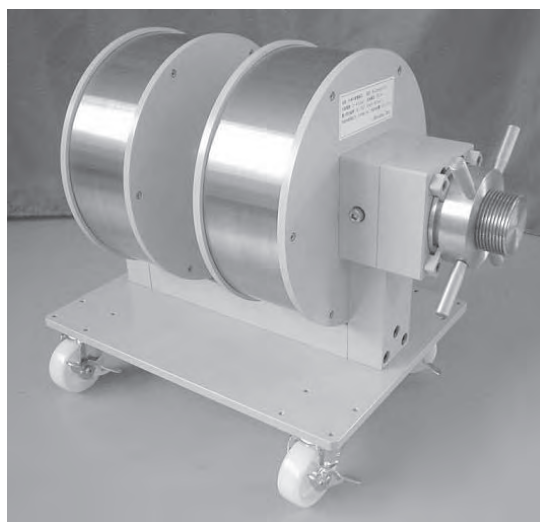
電磁石 ヘルムホルツコイル等 設計製作

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。



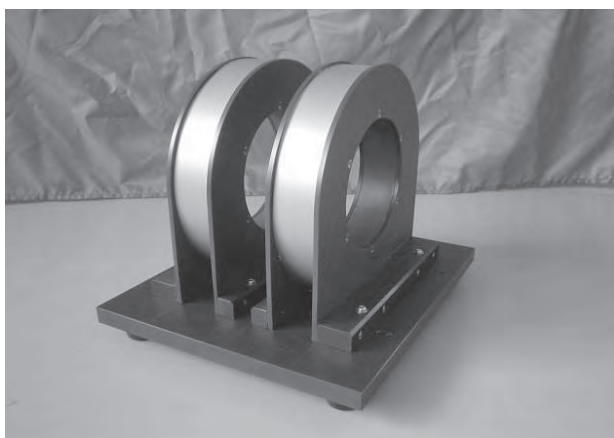
回転台付 片側可変電磁石



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。



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- 5T 高速測定モデル - ソレノイドコイル型超電導コイル式VSM

超電導コイル、VSMメーカーの強みを活かしVSM用として最適化した高速測定が可能な超電導コイルを開発。

従来の超電導コイル式VSMよりも低価格ですが磁場均一度が良く、高速で10mmcubeから薄膜まで測定可能なVSMシステムです。

- 最大10mmcubeから薄膜まで測定可能 -

国内外最大サイズサンプルのVSM測定が可能。

サンプルを極小に加工する必要がなく、加工歪の影響が少ない測定が可能です。

もちろん極小サイズの測定も行うことができます。

- 高速測定にも対応 -

最速 5T フルループ測定 4分

※フルループ測定：6回上げ下げ (0T→5T→0T→-5T→0T→5T→0T)

常電動電磁石式VSMと同等の測定時間となり、従来超電導コイル式VSMの測定に長時間を要するデメリットを克服しました。

- 主な仕様 -

最大発生磁界：±5T

均一度：0.1% / 10mm cube

室温ポア径：φ50.8mm

サンプルサイズ：バルク 10mmcube以内、

薄膜 12mm角以内

粉体 容器内径6mmφ×2.5mm

- 構成 -

VSMシステム

超電導コイル

(冷凍システム、温度モニターユニット込)

励磁用バイポーラ電源

(クエンチ検出・保護回路込)

オプション：真空排気セット(手持品転用可)

温度制御装置(-50℃~200℃ ガス吹きかけタイプ)

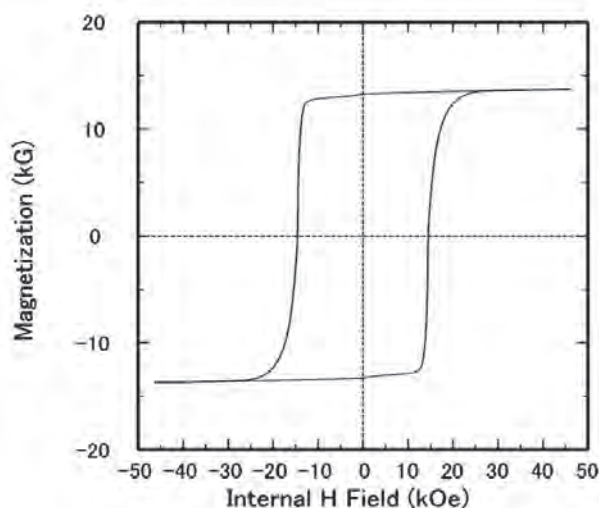
- 超電導コイルも製作しており

必要仕様に合わせてVSMをご提案致します-

10T 30mmcube測定可能モデル



- NdFeB 10mmcube測定例 -



5Tソレノイドコイル型超電導コイル式VSM
フルループ 4分にて測定

低価格高速測定モデル構成例

5Tソレノイドコイル型超電導コイル式VSMシステム



- 委託測定を受付けております -

お手持ちのサンプルを弊社デモ機にて測定致します。
最大発生磁界10T ソレノイドコイル型超電導コイル式VSMを
社内に常設しております。

社内デモ機の場合、30mmcubeまで測定可能です。

サンプルや測定の条件など御気軽にお問合せください。

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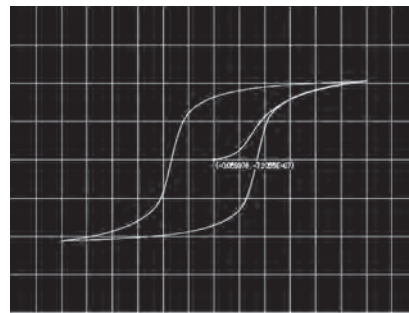
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測定モード

- ・ 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



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。

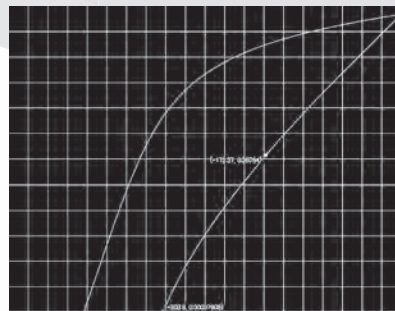
BH-1000



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。