

**The Eighth Perpendicular Magnetic
Recording Conference
(PMRC 2007)**

**Oct 15 - 17, 2007
Tokyo International Forum
Tokyo, Japan**



<http://www.spin.pe.titech.ac.jp/pmrc2007/>

**Sponsored by
Committee 144 (Magnetic Recording) of The Japan
Society for The Promotion of Science
and
The Magnetics Society of Japan**

**In co-operation with
The Institute of Electronics, Information and
Communication Engineers,
The Institute of Image Information and Television
Engineers,
Storage Research Consortium,
and
IEEE Magnetics Society**

GENERAL INFORMATION

The Eighth Perpendicular Magnetic Recording Conference (PMRC 2007) will be held at the Tokyo International Forum in Tokyo, Japan from October 15 through 17, 2007. The conference site is located next to the JR Tokyo Station at the heart of Metropolitan Tokyo. PMRC conferences have been held every two or three years since 1989. The conferences have provided unique opportunities to exchange information and promote intensive discussion on the latest scientific and technical progress in the field of perpendicular magnetic recording and high-density storage technologies.

SCOPE

Perpendicular magnetic recording was introduced into commercial hard disk drives in 2005, and promises to advance the areal recording density towards 1 Tbits/inch² and beyond. Emerging applications of HDDs are demanding rapid increases in storage capacity and areal density. The Eighth Perpendicular Magnetic Recording Conference is aimed at discussing the possible options and migration pathways to ultrahigh areal density perpendicular magnetic recording and related high-density storage technologies. At PMRC 2007 all topics that contribute to the progress of perpendicular magnetic recording and high-density storage technologies will be discussed.

The program consists of invited and contributed papers falling within the following categories:

1. Recording physics (R/W characteristics, modeling, simulations)
2. Magnetic write heads and soft magnetic materials
3. Magnetic read heads and sensors
4. Recording media and materials, microstructure, magnetic imaging
5. Signal processing
6. Tracking servo and low spacing technologies (HDI, tribology)
7. Storage systems
8. New storage technologies

PRESENTATIONS

Presentations will consist of oral and poster sessions. The official language for all presentations is English. At least one author of each presentation must be a registered participant of PMRC 2007. Oral sessions will include

invited and contributed papers and will cover the technological frontiers of perpendicular magnetic recording and high-density storage technologies. The conference is aimed at exchanging information and promoting intensive discussion among the participants. The invited and contributed speakers are allocated 20 and 12 minutes for talk and 5 and 3 minutes for questions and discussion, respectively. Only PC projector is available for all the oral presentations.

The scheduled invited speakers are in the following: R. Rutledge (WD), F. Kugiya (HGST), H. Lee (Samsung), Y. Hsia (Seagate), S. Mao (WD), Y. Zheng and G.Han (DSI), K. Yamakawa (AIT), G. Ju (Seagate), J. Zhu (CMU), Y. Hsu (HGST), T. Roppongi (TDK), H. Katada (Hitachi), M. Hashimoto (Hitachi), M. Takahashi (Tohoku U.), D. Sues (Vienna U. of Tech.), S. Okamoto (Tohoku U.), T. Thomson and B. Terris (HGST), R. Chantrell (U. of York), R. Sinclair (Stanford U.), Y. Hosoe (Hitachi), K. Ono (Hitachi), B. Liu (DSI), H. Saito (Kogakuin U.), T. Duman (Arizona State U.), M. Schabes (HGST), O. Heinonen (Seagate), S. Greaves (Tohoku U.), C. Che (Samsung), and R. Victora (U. of Minnesota). In addition, an opening talk by S. Iwasaki (Tohoku Inst. of Tech.) and a special talk by E. Shoyama (Hitachi) will be given in the opening session and four invited talks by T. Coughlin (Coughlin Ass.), R. Shimizu (Matsushita), S. Tokumitsu (Toshiba), and R. Thibadeau (Seagate) are also scheduled in the evening symposium.

POSTER SESSIONS

Most of the contributed papers will be presented at the poster sessions, which are the heart of the conference. The poster board area for each presentation is approximately 900 mm high x 1800 mm wide. Each board has a small table placed in front of it. The size of poster materials should be easily read at a distance of a few meters. The posting of pages of a manuscript is strongly discouraged.

Authors should set up their materials at least 30 minutes before starting the poster session. Authors of odd number papers are requested to be at their posters for the first 45 min and authors of even number papers for the latter 45 min. Authors are requested to remove all of their materials promptly at the end of their sessions, excluding the push pins that will be provided by the Conference. The Conference Coordinators will discard the materials remained in the session site.

PROGRAM BOOKLET AND PROCEEDINGS

Authors and other prospective participants, who have sent in their request to the general secretariat, will receive a PMRC 2007 Program Booklet. In addition to the program, travel, accommodation, and social activities' information, are included in the Program Booklet.

Authors who have submitted a digest for the PMRC 2007 should consider submitting full-paper manuscripts for publication in the "Proceedings of the PMRC 2007" of the *Journal of Magnetism and Magnetic Materials*. Detailed instructions on the preparation of full paper manuscripts will be provided at the Conference web-site. After being reviewed, accepted papers will be published in 2008. The Proceedings will be distributed to all participants of the PMRC 2007 by post.

CONFERENCE LOCATION AND DATE

The Eighth International Perpendicular Magnetic Recording Conference (PMRC 2007) will be held from Monday, October 15 to Wednesday, October 17, 2007 at Tokyo International Forum in Tokyo, Japan. The Tokyo International Forum in down town Tokyo was chosen for its convenience for participants from all over the world. The Oral and Poster sessions will be held at Hall B7, located at the 7th floor of B-block of the site.



Tokyo International Forum

ACCESS TO CONFERENCE SITE

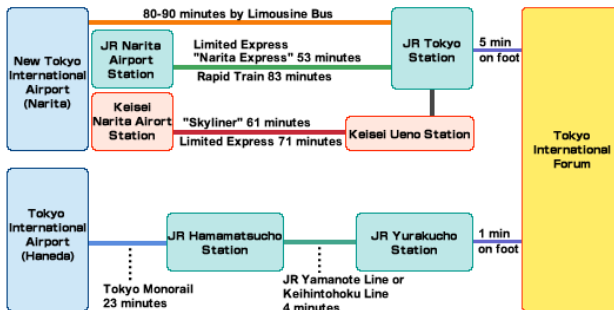
The conference site for PMRC 2007, the Tokyo International Forum is located at downtown area of Tokyo, Japan. It has excellent facilities and access. Detailed information on the venue can be found at the web site: <http://www.t-i-forum.co.jp/english/index.html>.



Location of Tokyo



Conference site location



Access to Tokyo International Forum

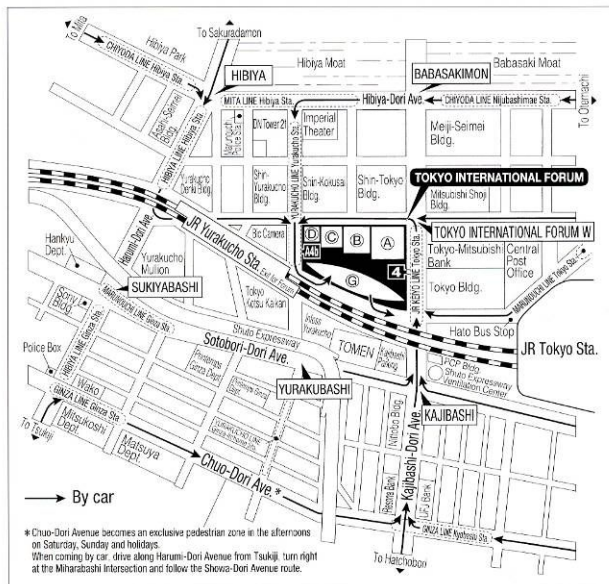
You can access to the conference site by JR line and Subways. Although JR Yurakucho station is the most convenient station, you can access to the conference site from Tokyo station by only 5 min. walk. Many ways to access the site are listed in the web site.

By JR line

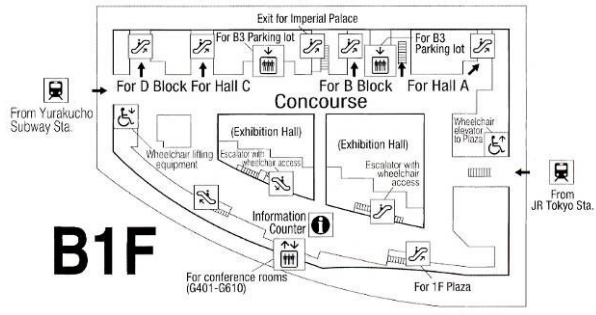
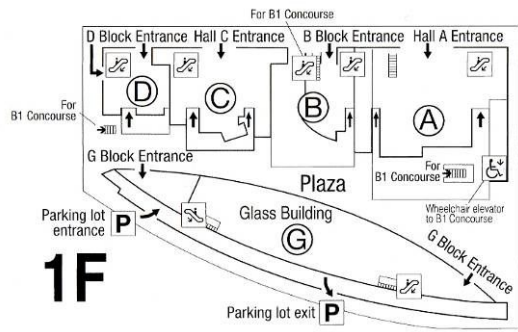
- 1 min. walk from Yurakucho Sta.
- 5 min. walk from Tokyo Sta. (connected to Keio Line through underground concourse[Exit 4])

By Subway

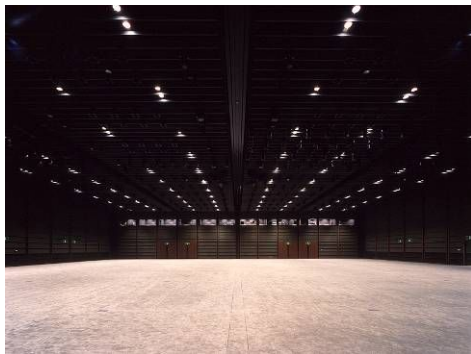
- Yurakucho line: (connected to Yurakucho Sta. through underground concourse[Exit 4b])
- Hibiya line : 5 min. walk from Hibiya Sta.
: 5 min. walk from Ginza Sta.
- Chiyoda line : 5 min. walk from Nijubashimae Sta.
: 7 min. walk from Hibiya Sta.
- Marunouchi line: 5 min. walk from Tokyo Sta.
: 5 min. walk from Ginza Sta.
- Ginza line : 7 min. walk from Ginza Sta.
: 7 min. walk from Kyobashi Sta.
- Mita line : 5 min. walk from Hibiya Sta.



Access map of Tokyo international Forum



Access to Tokyo international Forum on the ground floor and the B1 floor



Hall B7 at Tokyo international Forum

PASSPORT AND VISA

Every foreign visitor entering Japan must possess a valid passport. Participants requiring an entry visa should apply to the Japanese consular offices or diplomatic missions in their countries in advance. For details, participants are advised to consult local travel agents or carriers. You should note that entry problems are often encountered by passport-holders from countries whose residents require a visa, who arrive in Japan from visa exempt countries.

WEATHER

At the middle of October, the weather in Tokyo is usually sunny and comfortable, one of the best seasons in Japan. The average temperature is 20 °C. (The average low and high temperatures are 17 and 23 °C, respectively.)



Tokyo International Forum
5-1 Marunouchi 3-chome, Chiyoda-ku,
Tokyo 100-0005, Japan

REGISTRATION

Registration Fees

	Prior to Aug 31	On-site
Regular	¥ 50,000	¥ 60,000
IEEE or MSJ* members	¥ 45,000	¥ 55,000
Student/retiree	¥ 25,000	¥ 35,000

*The Magnetics Society of Japan

The Registration of PMRC 2007 is processed at the PMRC web-site. The registration fee includes participation in the conference, and copies of the Digests and Conference Proceedings that will be delivered after the conference by mail. We recommend that participants register in advance, to take advantage of the lower rate before September 1. Only credit cards are accepted for registration. Personal checks cannot be used. (Please refer to the web-site for details.)

PMRC 2007 Secretariat

Professor Hiroaki MURAOKA
General secretary of PMRC 2007
Research Institute of Electrical Communication
Tohoku University
2-1-1, Katahira, Aoba-ku, Sendai, 980-8577, Japan
e-mail: pmrc2007@kuroku.riec.tohoku.ac.jp
Fax: 81-22-217-5496

Registration Desk

The registration desk will be open from morning on Monday October 15th in the entrance lobby on the floor of hall B7 throughout the conference except the last day.

Oct 15 (Mon.) 8:30-18:00
Oct 16 (Tue.) 8:30-18:00
Oct 17 (Wed.) 8:30-13:30

HOTEL ACCOMMODATION

A selection of nearby hotels can be found by following the "Conference registration and/or Hotel reservations" link on the PMRC 2007 home page. Hotel reservations can be made after completing registration. Please consult the JTB Corp. Sendai Office at the address below, if you have any inquiries.

PMRC 2007 Travel Agency

Miki Endo, or Miyuki Orui
JTB Tohoku Corp, Group Tours Office Sendai
Event & Convention Group
Sasaju Bldg 6F, 3-6-1 Ichibancho, Aoba-ku,
Sendai, 980-0811, Japan
E-mail: sendai_conventio2@jtb.jp

CURRENCY EXCHANGE AND TIPPING

Foreign currency exchange is available at the banks in international airports. At major banks and hotels in Tokyo City, US dollars and some currencies and traveler's checks can be exchanged for Japanese yen. Banks are open from 9:00~15:00 Monday through Friday.

Tipping is not a common practice in Japan. You do not need to tip taxi drivers, waiters, waitresses, room maids, bellmen, etc. In hotels and high-class restaurants, a 10 % service charge would usually be included in the bill. A 5% consumption tax is added to most purchases.

Note: JR accepts major credit cards, with your personal identification number (PIN). Many banks in Japan do not accept major credit cards for foreign currency exchange.

SOCIAL PROGRAMS**CONFERENCE BANQUET**

All participants and accompanying persons are invited to attend the conference banquet, which will be held in the evening of Tuesday, October 16, following the sessions. It will feature a Tokyo Bay dinner cruise with a magnificent night view of the Tokyo waterfront. Tickets for the banquet cost 7,000 yen per person. Booking should be made in advance. (Please refer to the registration form.) A special talk by an invited speaker is also planned on the dinner cruise.

COFFEE AND BEER SERVICES

Coffee or tea will be available on Monday through Wednesday morning during the morning sessions. Beer and soft drinks will be served on Monday and Tuesday afternoon during the Poster Sessions.

CONFERENCE ORGANIZATION

ORGANIZING COMMITTEE (JSPS Committee 144)

S. Iwasaki, Chairman
(Tohoku Inst Tech)

H. Aoi (Tohoku Univ)	S. Onodera (Sony)
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	K. Yoshida (Kogakuin Univ)
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ADVISORY BOARD

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M. Mallery (Seagate)	R. L. White (Stanford Univ)
D. J. Mapps (Univ of Plymouth)	R. Wood (Hitachi GST)
C. D. Mee (INSIC)	J.G. Zhu (Carnegie Mellon Univ)
Y. Miura (Shinshu Univ)	
J. E. Monson (Harvey Mudd College (retired))	

EXECUTIVE COMMITTEE

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H. Muraoka, General Affairs Secretary
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R. S. Indeck (Washington Univ)	I. Tagawa (Hitachi GST)
A. Kikitsu (Toshiba)	A. Tanaka (Fujitsu)
B. Liu (DSI)	B. Terris (Hitachi GST)
M. Mallary (Seagate)	A. Torabi (Western Digital)
	R. Wood (Hitachi GST)
	T. Yamaguchi (Hitachi GST)

Publication

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(Waseda Univ)

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M. Mizumaki (JASRI)	M. Tanaka (AIST)

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K. Nakagawa, Co-Chairman
(Nihon Univ)

M. Igarashi (Hitachi)	S. Matsunuma
K. Kakizaki (Saitama Univ)	(Hitachi Maxell)
E. Miyashita (NHK)	

Auditor

T. Osaka (Waseda Univ)
K. Ouchi (AIT)
Y. Sugita (Tohoku Inst Tech)

PMRC 2007 Program

Oct. 15 (Mon.)	SS No.	Session / (Chair)
Morning I (10:00-10:50)	15aA	Opening & Special talk (J. Judy)
Morning II (10:50-12:30)	15aB	Systems and Applications (H. Takano)
Lunch		(12:30-14:00)
Afternoon I (14:00-16:05)	15pA	Symposium: Over 1 Tbps Head Technologies (S. Araki)
Afternoon II (16:05-17:30)	15pB-D	Posters: Recording Phys., Heads, Media I (I. Tagawa, A. Tanaka, N. Abarra)
Evening (17:30-19:10)	15pF	Symposium: Social Impact of Mass Storage (R. Indeck)
Oct. 16 (Tue.)	SS No.	Session / (Chair)
Morning I (9:00-10:25)	16aA	Recording Physics (A. Torabi)
Coffee break		(10:25-10:40)
Morning II (10:40-12:40)	16aB	Write and Read Heads (K. Noguchi)
Lunch		(12:40-14:00)
Afternoon I (14:00-16:05)	16pA	Symposium: Advanced Media (G. Bertero)
Afternoon II (16:05-17:30)	16pB-E	Posters: Media II-III, Signal Proc., New Tech. (A. Kikitsu, H. Mutoh, R. Michel)
Evening (19:00-21:30)		Banquet (Dinner cruise on Tokyo Bay)
Oct. 17 (Wed.)	SS No.	Session / (Chair)
Morning I (9:00-11:05)	17aA	Media IV (M. Futamoto)
Coffee break		(11:05-11:25)
Morning II (11:25-12:30)	17aB	HDI and Servo (T. Yamaguchi)
Lunch		(12:30-14:00)
Afternoon I (14:00-15:35)	17pA	Signal Processing (J. Cruz)
Coffee break		(15:35-15:55)
Afternoon II (15:55-18:00)	17pB	Symposium: Future Extension of PMR (R. Wood)

Time allocation:

Invited talks: 25 min (20 min talk + 5 min discussion)

Contributed talks: 15 min (12 min talk + 3 min discussion)

Monday, 15 Oct.

Morning I ----- 10:00-10:50

Session 15aA Opening & Special Talk

J. H. Judy (Univ. of Minnesota)

15aA-00* **The 30th Anniversary of The Invention of Perpendicular Magnetic Recording**

10:00 Jack H. JUDY
University of Minnesota

15aA-01* **Past and Present of Perpendicular Magnetic Recording**

10:05 Shun-ichi IWASAKI^{1,2}
1) *Tohoku Institute of Technology*
2) *Member of the Japan Academy*

15aA-02* **Creating Scientific Development and Persistent Innovation**

10:25 Etsuhiko SHOYAMA^{1,2}
1) *Chairman of the Board, Hitachi Ltd.*
2) *Executive Member of the Council for Science and Technology Policy*

Morning II ----- 10:50-12:30

Session 15aB Systems & Applications

H. Takano (Hitachi GST)

15aB-01* **Storage Market: Opportunities, Myths and Facts**

10:50 William CAIN, Richard RUTLEDGE, Derek CHEN,
Young LEE, and Kenny COKER
Western Digital

15aB-02* **iVDR Business Perspective**

11:15 Fumio KUGIYA, Hiroshi NISHIDA, Atsushi SAITOU,
Naoki KODAMA
Hitachi Global Storage Technologies Japan, Ltd.

15aB-03* **The Future of SFF HDD and Its Competitiveness to SSD**

11:40 Hyung Jai LEE, Carl CHE and Debasis BARAL
Samsung Information Systems America

15aB-04* **A Preliminary Study of Application of Magnetic Hard Disk Drive for Deep-Space Exploration Missions**

12:05 Yiao-Tee HSIA¹, Karl STRAUSS²
1) *Seagate Technology*
2) *Jet Propulsion Laboratory, California Institute of Technology*

Afternoon I ----- 14:00-16:05

Session 15pA Symposium: Over 1 Tbps Head Technologies

S. Araki (Hitachi GST)

15pA-01* **Designs and Challenges for 1Tbit/in² Reader**

14:00 Sining MAO, Michael HO, Laurence CHEN, Eric CHAMPION, Lieping ZHONG, and Shaoping LI
Western Digital

15pA-02* **Thermal Magnetic Noise Control in the Ultra-High Density Read Head**

14:25 Yuankai ZHENG, Guchang HAN and Bo LIU
Data Storage Institute

15pA-03* **Shielded Planar Write Head**

14:50 K. YAMAKAWA, K. ISE, S. TAKAHASHI, N. HONDA, K. OUCHI
AIT, Akita Prefectural R & D Center

15pA-04* **Updates on Heat Assisted Magnetic Recording**

15:15 Ganping JU, Michael A. SEIGLER, Edward GAGE, William A. CHALLENGER, Kalman PELHOS, Duane KARNs, Bin LU, Yingguo PENG, Chubing PENG, Nils GOKEMEIJER, Robert E. ROTTMAYER, Xiaomin YANG, Hua ZHOU, Tim RAUSCH, Xiaobin ZHU, Timothy J. KLEMMER, Xiaowei WU, and Julius HOHLFELD
Seagate Technology

15pA-05* **Microwave Assisted Magnetic Recording**

15:40 Jimmy ZHU, Xiaochun ZHU, and Yuhui TANG
Data Storage Systems Center, Carnegie Mellon University

Afternoon II ----- 16:05-17:30

Session 15pB Posters: Recording Physics

I. Tagawa (Hitachi GST)

15pB-01 **Necessary Conditions for Magnetization Transitions for Narrow Transition Width in Perpendicular Magnetic Recording**

Takeshi KATO, Kenji MIURA, Hajime AOI, and Hiroaki MURAOKA
Research Institute of Electrical Communication, Tohoku University

15pB-02 **Influence of Dot Edge Roughness Due to Lithography Process in Perpendicular Patterned Media**

Yusuke MURAKAMI, Kenji MIURA, Hajime AOI and Hiroaki MURAOKA
RIEC, Tohoku University

- 15pB-03 **Influence of Erase Band Width on Track-Edge Noise in Perpendicular Magnetic Recording**
Toshiyuki OGAWA, Kenji MIURA, Hajime AOI, and Hiroaki MURAOKA
RIEC, Tohoku University
- 15pB-04 **Characterization of Transition shifts in Perpendicular Magnetic Recording**
Kao SIANG CHAI and Zhejie LIU
Data Storage Institute
- 15pB-05 **Transition and Pulse Response Prediction for Perpendicular Recording using Patterned Media**
Z.J. LIU, B.J. CHEN and S.H. ZHANG
Data Storage Institute
- 15pB-06 **Inter-Track Interference Across Three Narrow Tracks**
Peter M. JERMEY, Hazel A. SHUTE, M. Zaki AHMED, David T. WILTON, and Des J. MAPPS
University of Plymouth
- 15pB-07 **3-D FEM Analysis of Thermal Degradation in Writing and Reading Characteristics of Perpendicular Magnetic Head**
Hiroaki KUROSE¹, Masaya OHTAKE², Daisuke MIYAGI¹ and Norio TAKAHASHI¹
1) *Okayama Univ.*
2) *FUJITSU LABORATORIES LTD.*
- 15pB-08 **Effect of Magnetostatic Interaction between a SPT Head and a Medium**
Kinya FUDANO^{1,2}, Yoshio SUZUKI³ and Yoshihisa NAKAMURA^{1,4}
1) *RIEC, Tohoku Univ.*
2) *NEC Software Tohoku, Ltd.*
3) *Hitachi, Ltd.*
4) *JST Innovation Plaza Miyagi*
- 15pB-09 **Effect of Inter-granular Interactions on Recording Characteristics**
E. MIYASHITA, M. KAWANA, H. SHIINO and N. HAYASHI
NHK Science and Technical Research Labs.
- 15pB-10 **Low Moment SUL Effects on Write Performances in a Trailing Shielded Pole PMR Head**
Kenichi TAKANO, Lijie GUAN, Yuchen ZHOU, Yue LIU, Joe SMYTH and Moris DOVEK
Headway Technologies

- 15pB-11 **Head Field Strength for SPT Head with Hard/Soft Magnetic Composite Pillar Array Media**
 Junsuke MATSUZAKI, Terumitsu TANAKA,
 Jeong-Ryul KIM, Hiroki KURISU and Setsuo
 YAMAMOTO
*Graduate School of Science and Engineering,
 Yamaguchi University*
- 15pB-12 **Influence of Head-Media Spacing on Head Field Distribution for Hard/Soft Magnetic Composite Pillar Array Media**
 Terumitsu TANAKA, Jeong-Ryul KIM, Junsuke
 MATSUZAKI, Hiroki KURISU and Setsuo
 YAMAMOTO
*Graduate School of Science and Engineering,
 Yamaguchi University*
- 15pB-13 **Fringe Field Distribution for SPT Head Combined with Hard/Soft Magnetic Composite Pillar Medium**
 Terumitsu TANAKA, Junsuke MATSUZAKI,
 Jeong-Ryul KIM, Hiroki KURISU and Setsuo
 YAMAMOTO
*Graduate School of Science and Engineering,
 Yamaguchi University*
- 15pB-14 **New Characterization Method of Data Stability in Perpendicular Magnetic Recording Head/Media System**
 Hoo-San LEE, Sok-Hyun KONG, Seong-Yong
 YOON, Hyun-Jei KIM, Hoon-Sang OH, Sung-Hoon
 CHOA
*Graduate School of Science and Engineering,
 Yamaguchi University*

Afternoon II ----- 16:05-17:30

Session 15pC Posters: Write and Read Heads

A. Tanaka (Fujitsu)

- 15pC-01 **Adjacent Track Interference analysis of shielded perpendicular writers**
 Akira MORINAGA¹, Masafumi MOCHIZUKI¹,
 Wataru KIMURA¹, Tomohiro OKADA¹, Norifumi
 MIYAMOTO¹, Youji MARUYAMA¹, David HISAO²,
 and Yimin HSU²
 1) *Hitachi Global Storage Technologies Japan, Ltd.*
 2) *Hitachi Global Storage Technologies, San Jose*
- 15pC-02 **Magnetization Measurement of Cusp-Field Single Pole Type Head by using Focused Hard X-ray Magnetic Circular Dichroism**

Kaori TAGUCHI¹, Yuji KONDO¹, Motohiro SUZUKI²,
Naomi KAWAMURA², Kiyoshi YAMAKAWA¹, Naoki
HONDA¹, and Kazuhiro OUCHI¹

1) AIT, Akita Prefectural R & D Center

2) JASRI, Japan Synchrotron Radiation Research
Institute

15pC-03 **Electrical Conductance Properties for Magnetic
Tunnel Junctions with MgO Barrier**

K. TAMANOI¹, M. OOGANE², Y. ANDO², T.
TANAKA¹, Y. UEHARA³ and T. UZUMAKI¹

1) Fujitsu Laboratories

2) Tohoku University

3) Fujitsu Limited

15pC-04 **Fabrication of MgO Barrier for Magnetic Tunnel
Junction in As-Deposited State Using
Amorphous RE-TM Alloy**

Hideto OHMORI, Tomoya HATORI, and Shigeki
NAKAGAWA

Dept. of Physical Electronics, Tokyo Institute of
Technology

15pC-05 **Enhancement of giant magnetoresistance in
current-perpendicular spin valves with high
resistivity ferromagnetic metals for a narrow
read-gap head**

Arata JOGO, Keiichi NAGASAKA, Hirotaka
OSHIMA, Takahiro IBUSUKI, Yutaka SHIMIZU and
Atsushi TANAKA

Fujitsu Laboratories Limited

15pC-06 **Self Organized Al Nano-Patterning Mechanism
on Cu-AIO_x NOL in CPP-Spin-Valves**

Y. SHIOKAWA, S. NOH, S. KAWASAKI, K.

MIYAKE, M. DOI, and M. SAHASHI

Department of Electronic Engineering, TOHOKU
UNIVERSITY

15pC-07 **NANOCONTACT MAGNETORESISTANCE in
CCP-CPP SPIN VALVES for OVER 1Tbit/in²**

M. TAKAGISHI, H. N. FUKU, S. HASHIMOTO, H.
IWASAKI

Corporate Research & Development Center,
Toshiba Corporation

15pC-08 **Oxide Magnetism and Exchange Bias of
CoFe/Cr-NOL**

K. SAWADA¹, K. FUTATUKAWA¹, M. DOI¹, N.
HASEGAWA², and M. SAHASHI¹

1) Department of Electronic Engineering, TOHOKU
UNIVERSITY

2) ALPS Electric Corporation

15pC-09 **Alignment of the Interfacial Spins in Metallic Polycrystalline Exchange Biased Systems**
Luis E. FERNANDEZ-OUTON, Gonzalo VALLEJO-FERNANDEZ and Kevin O'GRADY
University of York

15pC-10 **A model of thermal stability in exchange coupled Ferromagnetic/Antiferromagnetic bilayers**
B. CRAIG¹, R. LAMBERTON¹, A. JOHNSTON¹, U. NOWAK², R.W. CHANTRELL² and K. O'GRADY²
1) *Seagate Technology*
2) *Physics Department, The University of York*

Afternoon II ----- 16:05-17:30

Session 15pD Posters: Media I (granular media)

N. Abarra (CANON-ANELVA)

15pD-01 **The Microstructure and Magnetic Properties of Electrodeposited Co-Pt Thin Films on Ru Buffer Layer**
Chang-Hyoung LEE, Geun-Hee JEONG, Jung-Kab PARK, Chi-Goo KANG and Su-Jeong SUH
School of Advanced Material Science and Engineering, Sungkyunkwan University

15pD-02 **Study of Attempt Frequency in Sharrock's Formula for Perpendicular Recording Hard Disk Media**
Masukazu IGARASHI¹ and Yutaka SUGITA²
1) *Hitachi, Ltd.*
2) *Tohoku Institute of Technology*

15pD-03 **Validity of Thermal Activation Volume Estimated by Using Wohlfarth's Equation in Perpendicular Recording Hard Disk Media**
Masukazu IGARASHI¹, Fumiko AKAGI¹ and Yutaka SUGITA³
1) *Hitachi, Ltd., Tokyo*
2) *Tohoku Institute of Technology*

15pD-04 **Correlation of Fluctuation Field and Temperature Coefficient of Coercivity in CoCrPtB Thin Film**
Hiroaki NISHIO
School of Science and Technology, Meiji University

15pD-05 **Temperature and Magnetic Field Effect on the Magnetization Structure of High-Density Magnetic Recording Media**
Yusuke YASUI, Keisuke SHIMOMAI, and Masaaki FUTAMOTO
Chuo University

- 15pD-06 **Playback Performance and Microstructure of Sputtered Tape Media Formed by Facing Targets Sputtering**
 Satoshi MATSUNUMA¹, Tetsutaro INOUE¹, Tsugihiko DOI¹, Toshimitsu MATSUU², Atsuto HASHIMOTO², Hiroki FUJIURA², and Shigeki NAKAGAWA²
 1) *Hitachi Maxell*
 2) *Tokyo Institute of Technology*
- 15pD-07 **Ru-O/Ru hybrid Type of underlayer for CoPtCr-SiO₂ perpendicular recording tape media**
 Toshimitsu MATSUU¹, Atsuto HASHIMOTO¹, Hiroki FUJIURA¹, Satoshi MATSUNUMA², Tetsutaro INOUE², Tsugihiko DOI², and Shigeki NAKAGAWA¹
 1) *Dept. of Physical Electronics, Tokyo Institute of Technology*
 2) *Hitachi Maxell*
- 15pD-08 **Bidirectional Recording Performance of Perpendicular Evaporated Co-CoO Tape**
 Kazunari MOTOHASHI, Naoki IKEDA, Takanori SATO, Daizo SHIGA and Seiichi ONODERA
Sony Corporation
- 15pD-09 **Effect of Thermal Process on Magnetic Anisotropy in FeCoB Soft Underlayer**
 Atsuto HASHIMOTO, Toshimitsu MATSUU, Sukefumi ITO, and Shigeki NAKAGAWA
Dept. of Physical Electronics, Tokyo Institute of Technology
- 15pD-10 **Microstructure and Magnetic Property of Electroless-Plated CoNiFeB Soft Underlayer**
 Weixing XIA¹, Joong Jung KIM¹, Takeo YOGO¹, Daisuke SHINDO¹, Masaru ITO² and Ken OHASHI²
 1) *Tohoku University*
 2) *Shin-Etsu Chemical Co. Ltd.*
- 15pD-11 **Magnetic Circular Dichroism Study of [Co/Pd] and [CoB/Pd] multilayered films**
 Akane AGUI¹, Toru ASAHI², Junichi SAYAMA², Masaichiro MIZUMAKI³, Masahito TANAKA⁴ and Tetsuya OSAKA²
 1) *Synchrotron Radiation Research Center, Japan Atomic Energy Agency*
 2) *Graduate School of Advanced Science and Engineering, Waseda University*
 3) *Japan Synchrotron Radiation Research Institute*
 4) *Research Institute of Instrumentation Frontier, National Institute of Advanced Industrial Science and Technology*

- 15pD-12 **Damping constant of Co/Pt multilayer thin film media**
 N. FUJITA¹, N. INABA¹, F. KIRINO², S. IGARASHI¹,
 K. KOIKE¹ and H. KATO¹
 1) *Yamagata Univ.*
 2) *National University of Fine Arts and Music*
- 15pD-13 **XMCD Study of Pt Orbital Contribution to Perpendicular Magnetization in CoPt Thin-Films**
 N. ISHIMATSU¹, Y. TSUTSUI¹, H. MARUYAMA¹, N.
 KAWAMURA², M. SUZUKI², H. OSAWA², Y.
 OKAZAKI³, H. SATO³, T. SHIMATSU³, and H.
 MURAOKA³
 1) *Hiroshima University*
 2) *JASRI/SPRing-8*
 3) *Research Institute of Electrical Communication, Tohoku University*
- 15pD-14 **In-plane Magnetic Field Imaging of Perpendicular Magnetic Recording Media by Magnetic Force Microscopy using Transient Oscillation**
 H. SAITO¹, G. EGAWA¹, S. ISHIO¹ and G. Q. LI²
 1) *Akita Univ.*
 2) *Southwest Univ.*
- 15pD-15 **Exact solution and new approximation for a Stoner-Wohlfarth particle in an applied field**
 Roger WOOD
Hitachi Global Storage Technologies
- 15pD-16 **M_r-H Curves of Perpendicular Media Obtained under Pulse Field**
 Y. UESAKA¹, H. ENDO¹, Y. NAKATANI², N.
 HAYASHI³ and H. FUKUSHIMA³
 1) *Nihon Univ.*
 2) *Univ. of Electro-communications*
 3) *Independent*
- 15pD-17 **Saturation Magnetization for Co-based Alloy-oxide Composite Films**
 Shingo SASAKI¹, Shin SAITO² and Migaku
 TAKAHASHI²
 1) *Ichinoseki National College of Technology*
 2) *Dept. of Electronic Engng., Grad. School of Engng. Tohoku Univ.*
 3) *New Industry Creation Hatchery Center, Tohoku Univ.*
- 15pD-18 **High resolution CNT-MFM analysis of CoPtCr-SiO₂ granular perpendicular magnetic recording media**
 Mayumi KAWANA¹, Shunji TAKENOIRI², Hirotaka
 SHIINO¹, Eiichi MIYASHITA¹ and Naoto HAYASHI¹

- 1) *Science and Technical Research Labs. of NHK*
2) *Fuji Electric Device Technology Co., Ltd.*

- 15pD-19 **Remanent magnetization curve for perpendicular magnetic recording media along various direction of applied field by polar-Kerr detection system**
Daiji HASEGAWA¹, Shin SAITO¹, Norikazu ITAGAKI¹, Sakae MEGURO², Yasushi KONISHI², Eiji YANAGISAWA², Koichi AKAHANE², and Migaku TAKAHASHI¹
1) *Tohoku University*
2) *Neoark Corporation*
- 15pD-20 **Magnetization reversal in Co/Pt multilayers with a weak exchange coupling**
T. WANG^{1,2}, W. L. PEI¹, Y. FU¹, T. WASIYA¹, T. HASEGAWA¹, H. SAITO¹, and S. ISHIO¹
1) *Venture Business Laboratory, Akita University*
2) *Institute of applied magnetics, Lanzhou University*
- 15pD-21 **Magnetic Properties of CoPt-Si₃N₄/Ag Nanocomposite Films**
Y. H. FANG, P. C. KUO, P. L. LIN, G. P. LIN, and S. L. OU
Institute of Materials Science and Engineering, National Taiwan University
- 15pD-22 **Sputtered epitaxial Co-rich Co-Pt films for perpendicular magnetic recording media**
S. C. CHEN¹, P. C. KUO², C. L. SHEN², S. L. HSU² and Y. H. FANG²
1) *Department of Materials Engineering, MingChi University of Technology, and Center for Nanostorage Research, National Taiwan University*
2) *Institute of Materials Science and Engineering, National Taiwan University*
- 15pD-23 **Microstructure and Switching Mechanism of Stacked CoCrPt-SiO₂ Perpendicular Recording Media**
Kumar SRINIVASAN¹, S.N. PIRAMANAYAGAM¹, Roy CHANTRELL² and Yew Seng KAY¹
1) *Spintronics, Media and Interface Division, Data Storage Institute*
2) *Department of Physics, University of York*
- 15pD-24 **Perpendicular Magnetic Anisotropy of Co-Pt films using Zn Buffer Layer**
Geun-Hee JEONG, Jin-Soo KIM, In-Soo PARK, Joo-Hee JANG, and Su-Jeong SUH
Sungkyunkwan University

- 15pD-25 **Thermal Stability and the Magnetization Process in CoCrPt-SiO₂ Perpendicular Recording Media**
 S.N. PIRAMANAYAGAM¹, Kumar SRINIVASAN¹, Rachid SBIAA¹ and Roy CHANTRELL²
 1) *Spintronics, Media and Interface Division, Data Storage Institute*
 2) *Department of Physics, University of York*
- 15pD-26 **Structural and magnetic properties of Co-Cr/Pd multilayers**
 Kunihiro KOIKE¹, Kota BABA¹, Nobuyuki INABA¹, Yoshiya ADACHI¹, Hisamichi KIMURA² and Hiroaki KATO^{1,3}
 1) *Graduate school of Science and Engineering, Yamagata University*
 2) *Institute of Materials Research, Tohoku University*
 3) *NICHE, Tohoku University*
- 15pD-27 **Improvement of recording performances through optimization of exchange coupling in triple layered PMR media**
 Sooyoul HONG¹, Na-Young KIM¹, Xiaodong CHE¹, Young-Wook TAHK², and H. UWAZUMI³
 1) *Samsung Information Systems America*
 2) *Samsung Electronics Co. Ltd.*
 3) *Fuji Electric Device Technology Co. Ltd.*
- 15pD-28 **Preparation of granular-type perpendicular magnetic recording media with thin intermediate layer**
 Kazuhiko SHINTAKU
Research Institute of Advanced Technology, Akita Pref. R&D Center
- 15pD-29 **Uniaxial magnetic anisotropy and lattice deformation in Co and Co-Pt based perpendicular films**
 Yuko OKAZAKI, Takehito SHIMATSU, Hideo SATO, Osamu KITAKAMI, Satoshi OKAMOTO, Tomoaki SAKURAI, Hiroaki MURAOKA, Hajime AOI, Shunsuke TANII, and Akimasa SAKUMA
 1) *Research Institute of Electrical Communication, Tohoku University*
 2) *Institute of Multidisciplinary Research for Advanced Materials, Tohoku University*
 3) *Graduate School of Engineering, Tohoku University*
- 15pD-30 **AlN, TaN, a hexagonal-nitride seed layer for granular-type perpendicular media**
 Shinichi ISHIBASHI, Shin SAITO, Atsushi HASHIMOTO and Migaku TAKAHASHI
Tohoku University

15pD-31 **Quantitative evaluation of surface roughness of RuCr intermediate layer for magnetic isolation of granular-type perpendicular media**
Shinji YONEMURA¹, Shin SAITO², Atsushi HASHIMOTO² and Migaku TAKAHASHI²
1) *Williams Advanced Materials Japan Inc.*
2) *Tohoku University*

15pD-32 **Scaling of thermal decay in perpendicular media**
X.W. WU¹, R.J.M. VAN DE VEERDONK¹, T.R. KOHLER¹, P. ASSELIN¹ and R.W. CHANTRELL²
1) *Seagate Research*
2) *Department of Physics, University of York*

Evening ----- 17:30-19:10

Session 15pF Symposium: Social Impact of Mass Storage
R. S. Indeck (Washington Univ.)

15pF-01* **Personal Storage for Mobile Applications**
17:30 Thomas M. COUGHLIN
Coughlin Associates

15pF-02* **Expanding HDD installation to the digital consumer electronics**
— The evolution of HDD is boosting up the progress of a digital consumer electronics —
17:55 Ryosuke SHIMIZU
Matsushita Electric Industrial Co. Ltd.

15pF-03* **TV with HDD**
18:20 Shigenori TOKUMITSU, Yoichiro TANAKA
Digital Media Network Company, Toshiba Corporation

15pF-04* **Secured Storage**
18:45 Robert THIBADEAU
Seagate Technology

Tuesday, 16 Oct.

Morning I ----- 9:00-10:25

Session 16aA Recording Physics
A. Torabi (Western Digital)

16aA-01* **Influence of patterning fluctuation on read/write characteristics in discrete track and bit patterned media**
9:00 Mitsuhiro HASHIMOTO¹, Kenji MIURA², Hiroaki MURAOKA², Hajime AOI², Roger WOOD³, Michael SALO³, Yoshihiro IKEDA⁴

- 1) *Central Research Laboratory, Hitachi Ltd.*
- 2) *Research Institute of Electrical Communication, Tohoku Univ.*
- 3) *Advanced Technologies, Hitachi Global Storage Technologies*
- 4) *San Jose Research Center, Hitachi Global Storage Technologies*

- 16aA-02 **Simulations of continuous/cluster-pinned recording media**
 9:25 Cho-Mun LOKE, Simon GREAVES, Hiroaki MURAOKA
RIEC, Tohoku University
- 16aA-03 **Required Media Parameters for Thermal Stability in Perpendicular Magnetic Recording**
 9:40 Kenji MIURA, Atsushi NAKAMOTO, Mitsuhiro HASHIMOTO, Hajime AOI and Hiroaki MURAOKA
RIEC, Tohoku University
- 16aA-04 **Opposite Transition Shift of One Bit Written by Trapezoid Single Pole**
 9:55 Sheng-Bin HU, Zhi-Min YUAN, Sumitro Joyo TASLIM, Sheng-Kai YU and Bo LIU
Data Storage Institute
- 16aA-05 **Analysis of Waveform from Perpendicular Magnetic Printed Media**
 10:10 Nurul SHEEDA, Satoshi OKAMI, Takashi KOMINE and Ryuji SUGITA
Department of Media and Telecommunication Engineering, Ibaraki University
- Morning II ----- 10:40-12:40
Session 16aB Write and Read Heads
 K. Noguchi (TDK)
- 16aB-01* **Wrap-Around Shield Heads for High Areal Density Perpendicular Magnetic Recording**
 10:40 Yimin HSU, Wen-Chien HSIAO, Vladimir NIKITIN, Jianping CHEN and Mark SONG
Hitachi GST
- 16aB-02* **Perpendicular Magnetic Recording Heads for High Track Density**
 11:05 Tetsuya ROPPONGI and Norikazu OTA
TDK Corporation
- 16aB-03 **Stepped Side Shield Writer for Perpendicular Recording**
 11:30 Tomoko TAGUCHI and Akihiko TAKEO
HDD Development Dept., Core Technology Center, Toshiba Corporation

- 16aB-04 **Micromagnetic recording field analysis of a fast-switching single-pole-type head using a PC cluster system**
 11:45 Yasushi KANAI¹, Kazunori HIRASAWA¹, Toshio TSUKAMOTO¹, Kazuetsu YOSHIDA², Simon GREAVES³ and Hiroaki MURAOKA³
 1) *Niigata Institute of Technology*
 2) *Kogakuin University*
 3) *Tohoku University*
- 16aB-05 **Large exchange bias and high blocking temperature of MgO-barrier MTJs with L1₂-ordered Mn₃In as an antiferromagnetic layer**
 12:00 Koujiro KOMAGAKI¹, Kenji NOMA¹, Hitoshi KANAI¹, Kazuo KOBAYASHI¹, Yuji UEHARA¹, Masakiyo TSUNODA² and Migaku TAKAHASHI²
 1) *Advanced Head Technology Dept., Fujitsu Ltd.*
 2) *Tohoku University*
- 16aB-06* **CPP-GMR Heads with a Current Screen Layer for High-Areal-Density**
 12:15 Hiroyuki KATADA, Kazuhiro NAKAMOTO, Hiroyuki HOSHIYA, Katsumi HOSHINO, Nobuo YOSHIDA, Masato SHIIMOTO, Yo SATO, Masahiko HATATANI, and Katsuro WATANABE
Central Research Laboratory, Hitachi, Ltd.

Afternoon I ----- 14:00-16:05

Session 16pA Symposium: Advanced Media

G. Bertero (Komag)

- 16pA-01* **Advanced Granular-Type Perpendicular Recording Media — New materials and new stacked layer form —**
 14:00 Migaku TAKAHASHI¹, and Shin SAITO²
 1) *New Industry Creation Hatchery Center, Tohoku Univ.*
 2) *Dept. of Electronic Engng., Grad. School of Engng. Tohoku Univ.*
- 16pA-02* **Exchange Spring Exchange Spring Media for Perpendicular Recording**
 14:25 Dieter SUESS
Vienna University of Technology
- 16pA-03* **Magnetization behavior of nanomagnets for patterned media application**
 14:50 Satoshi OKAMOTO¹, Nobuaki KIKUCHI¹, Osamu KITAKAMI¹, and Takehito SHIMATSU²
 1) *IMRAM, Tohoku University*
 2) *RIEC, Tohoku University*

16pA-04* **Reversal and Recording Properties of Bit Patterned Media**
15:15 T. THOMSON, X. WU, A. MOSER, E. DOBISZ, O. HELLWIG, Z. BANDIC, D. KERCHER, T. ALBRECHT, B. TERRIS
San Jose Research Center, Hitachi Global Storage Technologies

16pA-05* **Magnetic properties of High T_c /low T_c bilayers for HAMR**
15:40 X.W. WU¹, R.J.M. VAN DE VEERDONK¹, P. ASSELIN¹, G. JU¹ and R.W. CHANTRELL²
1) *Seagate Research*
2) *Department of Physics, University of York*

Afternoon II ----- 16:05-17:30

Session 16pB Posters: Media II (materials & structures)

A. Kikitsu (Toshiba)

16pB-01 **Double Hysteresis due to Canted Spins by Co Mixed Crystal Phases in Exchange Biased [Pd/Co]_s/FeMn Thin Films with Perpendicular Anisotropy**
Sunwook KIM¹, Seongtae BAE¹, Ho-wan JOO², and Do Guwn HWANG²
1) *Biomagnetics Laboratory (BML), National University of Singapore*
2) *Nano Bio Laboratory (NBL), Sangji University*

16pB-02 **Annealing effect of the stack number N in [Pd/ferromagnet]N/FeMn films with out-of- plane magnetization**
Ho-wan JOO¹, Jang HEO², Sunwook KIM³, Seongtae BAE³, Ky-am LEE², Sang-suk LEE¹ and Do-guwn HWANG¹
1) *Nano Bio Laboratory, Sangji Univ.*
2) *Thin films Laboratory, Dankook Univ.*
3) *Biomagnetics Laboratory, National Univ. of Singapore*

16pB-03 **Magnetization reversal and relaxation phenomena in antiferromagnetically coupled multilayer with perpendicular anisotropy**
Y. FU, W. PEI, J. YUAN, T. WANG, T. WASHIYA, T. HASEGAWA, H. SAITO, S. ISHIO
Venture Business Laboratory, Akita University

16pB-04 **Ordering Kinetics of Perpendicular Magnetic Anisotropy L₁₀ FePt Thin Films Studied by X-ray Absorption Spectroscopy**
An-Cheng SUN¹, Jen-Hwa HSU¹, P.C. KUO², H.L. HUANG¹, H.M. TSAI³, and W.F. PONG³

- 1) *Department of Physics and Center for Nanostorage Research, National Taiwan University*
2) *Department of Materials Science and Engineering, National Taiwan University*
3) *Department of Physics, Tamkang University*

- 16pB-05 **The Effect of CuP Addition on Ordering Temperature for FePt Thin Films**
Koichi KAKIZAKI¹, Koichi HASEGAWA², Nobuo ISHII², Tomoyoshi ASAKI², Kenji KAMISHIMA¹ and Nobuyuki HIRATSUKA¹
1) *Saitama University*
2) *Ishifuku Metal Industry Co. Ltd.*
- 16pB-06 **Ordering and Grain Growth of FePt Thin Films by Annealing**
Norio MURAYAMA¹, Susumu SOEYA², Yoshio TAKAHASHI² and Masaaki FUTAMOTO¹
1) *Chuo University*
2) *CRL., Hitachi, Ltd.*
- 16pB-07 **As-grown preparation technique of FePt ordered alloy thin films**
Jun-ichi IKEMOTO, Shigeki NAKAGAWA
Dept. of Physical Electronics, Tokyo Institute of Technology
- 16pB-08 **Enhanced Perpendicular Magnetic Anisotropy of Co-Pt Thin Film by Magnetic Field Induced Texture of Ni-based Alloy**
Jin-Soo KIM, Geun-Hee JEONG, In-Soo PARK, Seung-Kyu LIM and Su-Jeong SUH
Sungkyunkwan University
- 16pB-09 **Fe-Pt-MgO Stacked Films for Perpendicular Magnetic Recording**
Haruki YAMANE and Toshio SUZUKI
Akita Research Institute of Advanced Technology
- 16pB-10 **Underlayer diffusion induced enhancement of coercivity in high anisotropy FePt thin films**
J. F. HU¹, J. S. CHEN^{1,2}, B. C. LIM¹, B. LIU¹
1) *Data Storage Institute*
2) *Department of Materials Science and Engineering, National University of Singapore*
- 16pB-11 **Granular L1₀ FePt-SiO₂ Thin Film for Perpendicular Magnetic Recording**
Pham Thanh CONG, An-Cheng SUN, and Jen-Hwa HSU
Department of Physics and Center for Nanostorage Research, National Taiwan University

- 16pB-12 **Influences of addition of Rh on magnetic properties of FePt film**
T. HASEGAWA, J. MIYAHARA, W. PEI, T. WANG, Y. FU, T. WASHITA, H. SAITO, S. ISHIO
Department of Materials Science and Engineering, Akita University
- 16pB-13 **Effect of carbon addition on magnetic domain structure in SmCo₅ perpendicular thin films**
Isao KOIZUMI¹, Toru ASAHI¹, Yuta KIKUCHI¹, Masahiro YOSHINO¹, Atsushi SUGIYAMA², and Tetsuya OSAKA¹
1) *Graduate School of Advanced Science and Engineering, Waseda University*
2) *Waseda Institute for Advanced Study, Waseda University*
- 16pB-14 **Synthesis of fcc-FePt nanocubes with monodisperse diameter of 6 nm by polyol method**
Takuma HACHISU¹, Atsushi SUGIYAMA², Hironori IIDA¹, Takuya NAKANISHI³, Toru ASAHI¹, and Tetsuya OSAKA¹
1) *Waseda Univ.*
2) *Waseda Institute for Advanced Study, Waseda Univ.*
3) *Institute for Biomedical Engineering, Waseda Univ.*
- 16pB-15 **Fabrication of Co-Pt ordered alloy films with a large uniaxial anisotropy by sputter deposition**
Hideo SATO¹, Takehito SHIMATSU¹, Yuko OKAZAKI¹, Osamu KITAKAMI², Satoshi OKAMOTO², Hiroaki MURAOKA¹ and Hajime AOI¹
1) *Research Institute of Electrical Communication, Tohoku University*
2) *Institute of Multidisciplinary Research for Advanced Materials, Tohoku University*
- 16pB-16 **SNR Improvement by Intergranular Exchange Coupling in CGC Perpendicular Magnetic Recording Media**
Junichi YASUMORI, Kenji MIURA and Hiroaki MURAOKA
RIEC, Tohoku University
- 16pB-17 **Demagnetizing Effect on Soft/Hard Stacked Perpendicular Magnetic Recording Media**
Ying WANG^{1,2}, Fashen LI², Jun ARIAKE³, Naoki HONDA³, Shunji ISHIO¹, Kazuhiro OUCHI³
1) *Venture Business Laboratory, Akita University*
2) *Institute of Applied Magnetism, Lanzhou University*

3) *Research Institute of Advanced Technology,
Akita Prefectural R & D Center*

- 16pB-18 **A Method to Evaluate The Thermal Stability of Thin-Film Exchange Coupled Composite Media**
Yuji KONDO, Natsuumi UDAGAWA and Kazuetsu YOSHIDA
Kogakuin University
- 16pB-19 **Micromagnetic simulation of an exchange-coupled composite media using a negative K_u layer**
Yousuke ISOWAKI, Tomoyuki MAEDA and Akira KIKITSU
Corporate R&D center, Toshiba Corporation
- 16pB-20 **Thermal stability and switching field of Hard/Soft-stacked granular perpendicular media**
Koji KUDO^{1,2,3}, Takehito SHIMATSU¹, Noriyuki ASAKURA^{1,4}, Yuki INABA¹, Osamu KITAKAMI², Satoshi OKAMOTO², Hiroaki MURAOKA¹, and Hajime AOI¹
1) *Research Institute of Electrical Communication, Tohoku University*
2) *Institute of Multidisciplinary Research for Advanced Materials, Tohoku University*
3) *Tanaka Kikinzoku Kogyo K. K.*
4) *Yamagata Fujitsu Ltd.*
- 16pB-21 **Magnetic properties of Hard/Soft-stacked granular perpendicular media with various soft layer thickness**
Akira SATOH^{1,2}, Takehito SHIMATSU¹, Noriyuki ASAKURA^{1,3}, Osamu KITAKAMI⁴, Satoshi OKAMOTO⁴, Hiroaki MURAOKA¹, and Hajime AOI¹
1) *Research Institute of Electrical Communication, Tohoku University*
2) *Fuji Electric Device Technology Co., Ltd.*
3) *Yamagata Fujitsu Ltd.*
4) *Institute of Multidisciplinary Research for Advanced Materials, Tohoku University*
- 16pB-22 **Percolated Perpendicular Media (PPM) Fabricated on Pre-patterned Substrate**
M. Tofizur RAHMAN, Nazmun Nahar SHAMS and Chih-Huang LAI
National Tsing Hua University

Afternoon II ----- 16:05-17:30

Session 16pC Posters: Media III (BPM and HAMR)

A. Kikitsu (Toshiba)

- 16pC-01 **Epitaxial Growth of Co(0001)_{hcp}/Fe(110)_{bcc} Magnetic Bi-layer Films on SrTiO₃(111) Substrates**
Mitsuru OHTAKE¹, Kouhei SHIKADA¹, Fumiyoshi KIRINO² and Masaaki FUTAMOTO¹
1) *Chuo University*
2) *Tokyo National University of Fine Arts and Music*
- 16pC-02 **Magnetization behavior of Hard/Soft Magnetic Composite Pillar**
Terumitsu TANAKA, Jeong-Ryul KIM, Junsuke MATSUZAKI, Hiroki KURISU and Setsuo YAMAMOTO
Graduate School of Science and Engineering, Yamaguchi University
- 16pC-03 **Fabrication of CoPt Magnetic Nanodot Arrays by Electrodeposition Process**
T. OUCHI, Y. ARIKAWA and T. HOMMA
Department of Applied Chemistry, Waseda University
- 16pC-04 **Size dispersion of magnetic dots arranged in hexagonal guide**
Kaori KIMURA, Masatoshi SAKURAI, Kazuto KASHIWAGI, Yoshiyuki KAMATA, Akira KIKITSU, Katsuyuki NAITO
Corporate Research and Development Center, Toshiba Corporation
- 16pC-05 **Etching damage analysis of Co/Pt multilayers patterned media**
Satoshi SHIROTORI, Yoshiyuki KAMATA, Tomoyuki MAEDA, Kazuto KASHIWAGI, Yousuke ISOWAKI and Akira KIKITSU
Corporate Research & Development Center, Toshiba Corporation
- 16pC-06 **Magnetization reversal of Co/Pt nanodot by applying pulse field**
Satoshi OKAMOTO, Atsuo ITO, Nobuaki KIKUCHI, Osamu KITAKAMI
Institute of Multidisciplinary Research for Advanced Materials, Tohoku University
- 16pC-07 **Magnetization behavior and reversal process of Co/Pt multilayer nanodot**
Nobuaki KIKUCHI, Satoshi OKAMOTO, Takahiro KATO, Osamu KITAKAMI
Institute of Multidisciplinary Research for Advanced Materials, Tohoku University
- 16pC-08 **Magnetization reversal of Co-Pt/Co Hard/Soft-stacked dot arrays**

Kaname MITSUZUKA, Nobuaki KIKUCHI, Takehito SHIMATSU, Osamu KITAKAMI, Hiroaki MURAOKA and Hajime AOI

1) *Research Institute of Electrical Communication, Tohoku University*

2) *Institute of Multidisciplinary Research for Advanced Materials, Tohoku University*

- 16pC-09 **Structure and magneto-optical properties of FeRh thin films**
Sho INOUE, Nguyen N. PHUOC, Jiangwei CAO, Y.Y.K. HNIN and Takao SUZUKI
Information Storage Materials Laboratory, Toyota Technological Institute
- 16pC-10 **Magnetization Behavior during the AF-FM Transition in Single Crystal FeRh Thin Films**
Jiangwei CAO, Takao SUZUKI, Nguyen Nguyen PHUOC, Hnin YU YU KO and Sho INOUE
Information Storage Materials Laboratory, Toyota Technological Institute
- 16pC-11 **Effect of Co layer thickness on the magnetic properties of $Tb_{30}Co_{70}/SiN_x/Co$ thin films**
G. P. LIN¹, S. C. CHEN², P. C. KUO¹, Y. H. FANG¹, P. L. LIN¹
1) *Department of Materials Science and Engineering, National Taiwan University*
2) *MingChi University of Technology*
- 16pC-12 **Magnetic and structural characterizations on nano-particles of FePt, FeRh and their composites**
Hnin YUYUKO, Takao SUZUKI, Nguyen N. PHUOC and Jiangwei CAO
Information Storage Materials Laboratory, Toyota Technological Institute
- 16pC-13 **Macroscopic and element selective magnetic properties of TbCo/Pd multilayered and single layered film**
Masahito TANAKA¹, Toru ASAH², Akane AGUI³, Masaichiro MIZUMAKI⁴, Junichi SAYAMA² and Tetsuya OSAKA²
1) *Research Institute of Instrumentation Frontier, National Institute of Advanced Industrial Science and Technology (AIST)*
2) *Graduate School of Advanced Science and Engineering, Waseda University*
3) *Synchrotron Radiation Research Center, Japan Atomic Energy Agency*
4) *Japan Synchrotron Radiation Research Institute*

Session 16pD Posters: Signal Processing

H. Mutoh (Fujitsu)

- 16pD-01 **New Method for Generalised PR Target Design for Perpendicular Magnetic Recording**
P. SHAH¹, M.Z. AHMED¹ and Y. KURIHARA²
1) *Centre for Research in Information Storage Technology, University of Plymouth*
2) *Department of Electronic Control Engineering, Niihama National College of Technology*
- 16pD-02 **Performance of a Chase-Type Decoding Algorithm for Reed-Solomon Codes on Perpendicular Magnetic Recording Channels**
Han WANG, Wu CHANG and J. R. CRUZ
School of Electrical and Computer Engineering, University of Oklahoma
- 16pD-03 **Read Channel Simulation Based on Micromagnetic and Microtrack Modeling for One Terabit per Square Inch Magnetic Recording**
Xiaoxin ZOU, Zhiliang QIN, Kui CAI and Kao Siang CHAI
Data Storage Institute
- 16pD-04 **Iterative Decoding Algorithm Using Attenuated Information in PMR with Bit-Patterned Medium**
Yasuaki NAKAMURA¹, Mitsuhiro NISHIMURA¹, Yoshihiro OKAMOTO¹, Hisashi OSAWA¹, Hajime AOI², Hiroaki MURAOKA², and Yoshihisa NAKAMURA²
1) *Graduate School of Science and Engineering, Ehime University*
2) *Research Institute of Electrical Communication (RIEC), Tohoku University*
- 16pD-05 **Performance of GPRML-AR System in Perpendicular Magnetic Recording Channel with Thermal Decay**
N. SHINOHARA¹, H. OSAWA¹, Y. OKAMOTO¹, Y. NAKAMURA¹, K. MIURA², H. MURAOKA², and Y. NAKAMURA²
1) *Graduate School of Science and Engineering, Ehime University*
2) *Tohoku Univ.*
- 16pD-06 **Constructive ITI Coded PRML System Based on Two Track Model for Perpendicular Magnetic Recording**
Y. KURIHARA¹, Y. TAKEDA¹, Y. TAKAISHI¹, Y. KOIZUMI¹, H. OSAWA², M. Z. AHMED³, and Y. OKAMOTO²

- 1) *Niihama National College of Technology*
- 2) *Ehime University*
- 3) *University of Plymouth*

Afternoon II ----- 16:05-17:30

Session 16pE Posters: New Technologies

R. Michel (Seagate Tech.)

- 16pE-01 **Computer Simulation of the R/W characteristics in Exchange Coupled Composite Media using Shielded Pole Head**
 Y. ITOH, M. MAEDA, K. MIYABE, K. NISHIKAWA, T. TANAKA, J. TODA, T. UZUMAKI and A. TANAKA
Fujitsu Laboratories Limited
- 16pE-02 **Effect of Discrete Track Medium at High Areal Density**
 Akimasa KAIZU, Yoshikazu SOENO and Katsumichi TAGAMI
TDK Corporation, SQ Research Center
- 16pE-03 **Fabrication of isolated FeNiPt particles and LLG Simulations of TbFeCo/FeNiPt CGC-Like Film**
 Taichi YODA¹, Hideyuki TANIKAWA¹, Fumihiro CHINO¹, Arata TSUKAMOTO² and Akiyoshi ITOH²
 1) *Graduate School of Nihon Univ.*
 2) *College of Science and Technology, Nihon Univ.*
- 16pE-04 **Optimisation of bit patterned media for 1 Tb/in²**
 Naomichi DEGAWA¹, Simon GREAVES¹, Hiroaki MURAOKA¹ and Yasushi KANAI²
 1) *RIEC, Tohoku University*
 2) *IEE, Niigata Institute of Technology*
- 16pE-05 **Simulation of Perpendicular Recording on Hard/Soft Magnetic Composite Pillar Array Medium**
 Setsuo YAMAMOTO, Terumitsu TANAKA and Hiroki KURISU
Graduate School of Science and Engineering, Yamaguchi University
- 16pE-06 **Recording Simulation beyond 2 Tbit/in² on Bit Patterned Media with Shielded Planar Head**
 Naoki HONDA, Kiyoshi YAMAKAWA and Kazuhiro OUCHI
Research Institute of Advanced Technology, Akita Pref. R&D Center

- 16pE-07 **Study of Resonance Effect on a Patterned Medium for Near-field Optics in Heat Assisted Hybrid Recording**
Satoshi KUDOH¹, Shigeki SUZUKI¹, Jooyoung KIM², Katsuji NAKAGAWA³ and Akiyoshi ITOH³
1) *Graduate School of Sci. and Tech., Nihon University*
2) *Toyohashi University of Technology*
3) *College of Sci. & Tech., Nihon University*
- 16pE-08 **Study of Overwrite Stability and Recording Field Sensitivity in Thermally Assisted Magnetic Recording Media**
Manabu TANI
Hitachi Maxell, Ltd.
- 16pE-09 **Micromagnetic Modeling for Heat Assisted Magnetic Recording**
Zhenghua LI¹, Dan WEI² and Fulin WEI¹
1) *Lanzhou University*
2) *DMSE, Tsinghua University*
- 16pE-10 **Stress assisted magnetization reversal in perpendicularly magnetized thin films**
Naoya SAITO, Michiya YAMADA, and Shigeki NAKAGAWA
Dept. of Physical Electronics, Tokyo Institute of Technology
- 16pE-11 **Study of Spin Accumulation at Room Temperature in the Non-local Geometry with Narrow Electrode Separation for Future Reader**
Hiromasa TAKAHASHI^{1,2}, Masaki YAMADA^{1,2}, Thomas BOONE³, Jordan A. KATINE³, Jeffrey R. CHILDRESS³, Robert FONTANA³, and Bruce A GURNEY³
1) *Central Research Laboratory, Hitachi Ltd.*
2) *Research Institute of Electrical communication, Tohoku University*
3) *Hitachi GST, San Jose Research Center*
- 16pE-12 **Conduction characteristics and magnetoresistance in NiFe nanocontacts**
Yuichi OHSAWA
Corporate R&D center, Toshiba Corporation
- 16pE-13 **Investigation of Cylindrical Magnetic Storage Systems**
Hiroshi YAMADA, Hiroyuki KIKUCHI, Takehito SHIMATSU, Isao WATANABE, Hajime AOI, Hiroaki MURAOKA, Junji NUMAZAWA, and Yoshihisa NAKAMURA
RIEC, Tohoku University

Evening ----- 19:00-21:30

Social Program
Dinner cruise on Tokyo Bay

Wednesday, 17 Oct.

Morning I ----- 9:00-11:05

Session 17aA Media IV

M. Futamoto (Chuo Univ.)

- 17aA-01* **Magnetic Design of Capped Perpendicular Media with Minor Loop Analysis**
9:00 Hiroaki NEMOTO, Ikuko TAKEKUMA, Hiroyuki NAKAGAWA, Takayuki ICHIHARA, Ryoko ARAKI, and Yuzuru HOSOE
Central Research Laboratory, Hitachi, Ltd.
- 17aA-02* **High Resolution TEM Analyses of Perpendicular Storage Media**
9:25 Robert SINCLAIR¹, Juliet RISNER^{1,2}, Unoh KWON^{1,3} and Faraz HOSSEIN-BABAEI¹
1) Dept. Materials Science and Engineering, Stanford University
2) Hitachi Global Storage Technologies
3) IBM Corporation
- 17aA-03 **Investigation of High and Low Mobility Sputter Conditions to Enhance Decoupling in Oxide Composite Media**
9:50 Hwan-Soo LEE¹, Sok-Hyun KONG², Hoo-San LEE², Hoon-Sang OH², and David E. LAUGHLIN¹
1) Data Storage Systems Center, Carnegie Mellon University
2) Samsung Advanced Institute of Technology
- 17aA-04 **CoCrPt-oxide Composite Perpendicular Magnetic Recording Media with Soft Magnetic Top Layers**
10:05 H. S. JUNG¹, E. M. T. VELU¹, S. S. MALHOTRA¹, W. JIANG¹, G. BERTERO¹, D. SUESS², and U. KWON³
1) R & D Center, Komag Inc.
2) Vienna University of Technology
3) IBM Microelectronics
- 17aA-05 **Element-Specific Hard X-ray Micro-Magnetometry of Magnetic Modifications in Co-Pt Dots by Ga Ions**
10:20 Yuji KONDO¹, Takashi CHIBA¹, Jun ARIAKE¹, Motohiro SUZUKI², Masafumi TAKAGAKI², Naomi KAWAMURA², and Naoki HONDA¹

- 1) *Research Institute of Advanced Technology, Akita Pref. R&D Center*
 2) *Japan Synchrotron Radiation Research Institute (JASRI)*

- 17aA-06 **In-field magnetic force microscopy analysis of perpendicular recording media**
 10:35 Wenli PEI¹, T. WANG¹, Y. FU¹, T. WASHIYA¹, T. HASEGAWA¹, H. SAITO¹ and S. ISHIO¹, K. MIURA² and H. MURAOKA², and N. HONDA³
 1) *Venture Business Lab, Akita Univ.*
 2) *RIEC, Tohoku University*
 3) *Akita Research Institute of Advance Technology (AIT)*
- 17aA-07 **Evaluation of Percolated Perpendicular Medium Performance Using FePt-MgO Films**
 Y.C. TSAI², An-Cheng SUN¹, Jen-Hwa HSU¹, P.C. KUO²
 10:50 1) *Department of Physics and Center for Nanostorage Research, National Taiwan University*
 2) *Department of Materials Science and Engineering, National Taiwan University*

Morning II ----- 11:25-12:30

Session 17aB HDI and Servo

- T. Yamaguchi (Hitachi GST)
- 17aB-01* **Dynamic Instability and Stabilizing Design Concept of Flying Head Slider in Near Contact Region**
 11:25 Kyosuke ONO
Central Research Laboratory, Hitachi Ltd.
- 17aB-02* **Head-Disk Interface Technology Towards Intermittent Lubricant Contact Recording**
 11:50 Bo LIU^{1,2}, Shengkai YU¹, Mingsheng ZHANG¹, Wei HUA¹, Chee-How WONG¹, Weidong ZHOU¹, Yijun MAN¹, and Yansheng MA¹
 1) *Data Storage Institute*
 2) *Nanyang Technological University*
- 17aB-03 **Slider Sub-mm Disk Waviness Unfollowing Characteristics under Thermal FH Actuation**
 12:15 Zhimin YUAN, Siang Huei LEONG, Sumitro Joyo TASLIM, Bo LIU
Data Storage Institute

Afternoon I ----- 14:00-15:35

Session 17pA Signal Processing

- J. R. Cruz (Univ. of Oklahoma)
- 17pA-01 **Error patterns and BER performance depending on write pre-compensation**

14:00 Y. OKAMOTO¹, T. BUSHISUE¹, Y. KURIHARA¹, Y. NAKAMURA¹, H. OSAWA¹, H. MURAOKA² and Y. NAKAMURA²

1) *Ehime University*
2) *Tohoku University*

17pA-02 **Optimum PR Target for Magnetic Recording Channels**

14:15 George MATHEW¹, Li CHEN², YuanXing LEE¹

1) *LSI Corporation*
2) *University of Colorado at Boulder*

17pA-03 **Noise-Predictive Turbo Equalization for Coded Perpendicular Recording Channels**

14:30 Zhiliang QIN, Xiaoxin ZOU and Kui CAI

Data Storage Institute

17pA-04* **Future Signal Processing for Magnetic Storage — Statistical Modeling and Inference for Data Detection in High Areal Density Recording —**

14:45 Hidetoshi SAITO¹, Masayuki HAYASHI² and Ryuji KOHNO²

1) *Faculty of Engineering, Kogakuin University*
2) *Graduate School of Engineering, Division of Physics, Electrical and Computer Engineering, Yokohama National University*

17pA-05* **Achievable Rates for Bit Patterned Media Recording with Write Asynchronism**

15:10 Jun HU¹, Tolga DUMAN¹, Fatih ERDEN²

1) *Arizona State University*
2) *Seagate Technology*

Afternoon II ----- 15:55-18:00

Session 17pB Symposium: Future Extension of PMR

R. Wood (Hitachi GST)

17pB-01* **Micromagnetic simulations for Terabit/in² magnetic recording head/media systems**

15:55 Manfred E. SCHABES

San Jose Research Center, Hitachi GST

17pB-02* **Extensions of Perpendicular Recording**

16:20 Olle HEINONEN and K. Z. GAO

Seagate Technology

17pB-03* **Simulations of magnetic recording for 1 Tb/in²**

16:45 Simon GREAVES¹, Hiroaki MURAOKA¹ and Yasushi KANAI²

1) *RIEC, Tohoku University*
2) *IEE, Niigata Institute of Technology*

- 17pB-04* **Promises and Challenges of a Recording System Using Discrete Track Media**
17:10 Xiaodong CHE¹, Kiseok MOON¹, Yawshing TANG¹, Nayoung KIM¹, Hyung Jai LEE¹, Shuyu ZHANG¹, Matthew MONECK², Yuhui TANG², Jian-Gang ZHU², Nobuyuki TAKAHASHI³
*1) Samsung Information Systems America
2) ECE Department, Carnegie Mellon University
3) Fuji Electric Advanced Technology Co., Ltd.*
- 17pB-05* **Exchange Coupled Composite Media: Future Directions**
17:35 R. H. VICTORA, Xiao SHEN, and Stephanie HERNANDEZ
University of Minnesota

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KIKUCHI	Nobuaki	16pC-07
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KIM	Jin-Soo	15pD-24
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KIM	Joong Jung	15pD-10
KIM	Jooyoung	16pE-07
KIM	Nayoung	17pB-04*
KIM	Na-Young	15pD-27
KIM	Sunwook	16pB-01
KIM	Sunwook	16pB-02
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KIMURA	Wataru	15pC-01
KIRINO	F.	15pD-12
KIRINO	Fumiyoshi	16pC-01
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KLEMMER	Timothy J.	15pA-04*
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KOIKE	Kunihiro	15pD-26
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KOMINE	Takashi	16aA-05
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KONDO	Yuji	16pB-18
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KONG	Sok-Hyun	15pB-14
KONG	Sok-Hyun	17aA-03
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KURIHARA	Y.	16pD-06	
KURIHARA	Yasushi	17pA-01	
KURISU	Hiroki	15pB-11	
KURISU	Hiroki	15pB-12	
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KUROSE	Hiroaki	15pB-07	
KWON	U.	17aA-04	
KWON	Unoh	17aA-02*	
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	LAMBERTON	R.	15pC-10
	LAUGHLIN	David E.	17aA-03
	LEE	Chang-Hyoung	15pD-01
	LEE	Hoo-San	15pB-14
	LEE	Hoo-San	17aA-03
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	LEE	Hyung Jai	15aB-03*
	LEE	Hyung Jai	17pB-04*
	LEE	Ky-am	16pB-02
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	LI	Shaoping	15pA-01*
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	MAO	Sining	15pA-01*
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	MATSUNUMA	Satoshi	15pD-06
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	MATSUZAKI	Junsuke	15pB-12
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	MIURA	Kenji	16aA-01*
	MIURA	Kenji	16aA-03
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MURAOKA	Hiroaki	16pE-13
MURAOKA	Hiroaki	17aA-06
MURAOKA	Hiroaki	17pA-01
MURAOKA	Hiroaki	17pB-03*
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NAKAGAWA	Shigeki	16pB-07	
NAKAGAWA	Shigeki	16pE-10	
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NISHIMURA	Mitsuhiro	16pD-04	
NISHIO	Hiroaki	15pD-04	
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	OGAWA	Toshiyuki	15pB-03
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	OHASHI	Ken	15pD-10
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OHTAKE	Mitsuru	16pC-01	
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ONODERA	Seiichi	15pD-08	
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OSAWA	Hisashi	16pD-05	
OSAWA	Hisashi	16pD-06	
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OSHIMA	Hiroataka	15pC-05	
OTA	Norikazu	16aB-02*	
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SAITO	H.	16pB-03
SAITO	H.	16pB-12
SAITO	H.	17aA-06
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SAITO	Shin	15pD-17
SAITO	Shin	15pD-19
SAITO	Shin	15pD-31
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SAITOU	Atsushi	15aB-02*
SAKUMA	Akimasa	15pD-29
SAKURAI	Masatoshi	16pC-04

SAKURAI	Tomoaki	15pD-29
SALO	Michael	16aA-01*
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SATO	Hideo	16pB-15
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SATO	Yo	16aB-06*
SATOH	Akira	16pB-21
SAWADA	K.	15pC-08
SAYAMA	Junichi	15pD-11
SAYAMA	Junichi	16pC-13
SBIAA	Rachid	15pD-25
SCHABES	Manfred E.	17pB-01*
SEIGLER	Michael A.	15pA-04*
SHAH	P.	16pD-01
SHAMS	Nazmun Nahar	16pB-22
SHEEDA	Nurul	16aA-05
SHEN	C. L.	15pD-22
SHEN	Xiao	17pB-05*
SHIGA	Daizo	15pD-08
SHIIMOTO	Masato	16aB-06*
SHIINO	H.	15pB-09
SHIINO	Hiroataka	15pD-18
SHIKADA	Kouhei	16pC-01
SHIMATSU	T.	15pD-13
SHIMATSU	T.	16pA-03*
SHIMATSU	Takehito	15pD-29
SHIMATSU	Takehito	16pB-15
SHIMATSU	Takehito	16pB-20
SHIMATSU	Takehito	16pB-21
SHIMATSU	Takehito	16pC-08
SHIMATSU	Takehito	16pE-13
SHIMIZU	Ryosuke	15pF-02*
SHIMIZU	Yutaka	15pC-05
SHIMOMAI	Keisuke	15pD-05
SHINDO	Daisuke	15pD-10
SHINOHARA	N.	16pD-05
SHINTAKU	Kazuhiko	15pD-28
SHIOKAWA	Y.	15pC-06

SHIROTORI	Satoshi	16pC-05
SHOYAMA	Etsuhiko	15aA-02*
SHUTE	Hazel A.	15pB-06
SINCLAIR	Robert	17aA-02*
SMYTH	Joe	15pB-10
SOENO	Yoshikazu	16pE-02
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SONG	Mark	16aB-01*
SRINIVASAN	Kumar	15pD-23
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STRAUSS	Karl	15aB-04*
SUESS	D.	17aA-04
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SUGITA	Yutaka	15pD-02
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SUGIYAMA	Atsushi	16pB-13
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SUH	Su-Jeong	15pD-01
SUH	Su-Jeong	15pD-24
SUH	Su-Jeong	16pB-08
SUN	An-Cheng	16pB-04
SUN	An-Cheng	16pB-11
SUN	An-Cheng	17aA-07
SUZUKI	M.	15pD-13
SUZUKI	Motohiro	15pC-02
SUZUKI	Motohiro	17aA-05
SUZUKI	Shigeki	16pE-07
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SUZUKI	Takao	16pC-10
SUZUKI	Takao	16pC-12
SUZUKI	Toshio	16pB-09
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T	TAGAMI	Katsumichi	16pE-02
	TAGUCHI	K.	15pC-02
	TAGUCHI	Tomoko	16aB-03
	TAHK	Young-Wook	15pD-27
	TAKAGAKI	Masafumi	17aA-05
	TAKAGISHI	M.	15pC-07

TAKAHASHI	Hiromasa	16pE-11
TAKAHASHI	Migaku	15pD-17
TAKAHASHI	Migaku	15pD-19
TAKAHASHI	Migaku	15pD-30
TAKAHASHI	Migaku	15pD-31
TAKAHASHI	Migaku	16aB-05
TAKAHASHI	Migaku	16pA-01*
TAKAHASHI	Nobuyuki	17pB-04*
TAKAHASHI	Norio	15pB-07
TAKAHASHI	S.	15pA-03*
TAKAHASHI	Yoshio	16pB-06
TAKAISHI	Y.	16pD-06
TAKANO	Kenichi	15pB-10
TAKEDA	Y.	16pD-06
TAKEKUMA	Ikuko	17aA-01*
TAKENOIRI	Shunji	15pD-18
TAKEO	Akihiko	16aB-03
TAMANOI	K.	15pC-03
TANAKA	A.	16pE-01
TANAKA	Atsushi	15pC-05
TANAKA	Masahito	15pD-11
TANAKA	Masahito	16pC-13
TANAKA	T.	15pC-03
TANAKA	T.	16pE-01
TANAKA	Terumitsu	15pB-11
TANAKA	Terumitsu	15pB-12
TANAKA	Terumitsu	15pB-13
TANAKA	Terumitsu	16pC-02
TANAKA	Terumitsu	16pE-05
TANAKA	Yoichiro	15pF-03*
TANG	Yawshing	17pB-04*
TANG	Yuhui	15pA-05*
TANG	Yuhui	17pB-04*
TANI	Manabu	16pE-08
TANII	Shunsuke	15pD-29
TANIKAWA	Hideyuki	16pE-03
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TASLIM	Sumitro Joyo	17aB-03
TERRIS	B.	16pA-04*
THIBADEAU	Robert	15pF-04*

THOMSON	T.	16pA-04*	
TODA	J.	16pE-01	
TOKUMITSU	Shigenori	15pF-03*	
TSAI	H.M.	16pB-04	
TSAI	Y.C.	17aA-07	
TSUKAMOTO	Arata	16pE-03	
TSUKAMOTO	Toshio	16aB-04	
TSUNODA	Masakiyo	16aB-05	
TSUTSUI	Y.	15pD-13	
U	UDAGAWA	Natsuumi	16pB-18
	UEHARA	Y.	15pC-03
	UEHARA	Yuji	16aB-05
	UESAKA	Y.	15pD-16
	UWAZUMI	H.	15pD-27
	UZUMAKI	T.	15pC-03
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	VAN DE VEERDONK	R.J.M.	16pA-05*
	VELU	E. M. T.	17aA-04
	VICTORA	Randall	17pB-05*
W	WANG	Han	16pD-02
	WANG	T.	15pD-20
	WANG	T.	16pB-03
	WANG	T.	16pB-12
	WANG	T.	17aA-06
	WANG	Ying	16pB-17
	WASHIYA	T.	16pB-03
	WASHIYA	T.	16pB-12
	WASHIYA	T.	17aA-06
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	WILTON	David T.	15pB-06
	WONG	Chee-How	17aB-02*
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	WU	X.W.	16pA-05*
	WU	Xiaowei	15pA-04*
X	XIA	Weixing	15pD-10
Y	YAMADA	Hiroshi	16pE-13
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	YAMADA	Michiya	16pE-10
	YAMAKAWA	K.	15pA-03*
	YAMAKAWA	K.	15pC-02
	YAMAKAWA	Kiyoshi	16pE-06
	YAMAMOTO	Setsuo	15pB-11
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	YANAGISAWA	Eiji	15pD-19
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	YASUI	Yusuke	15pD-05
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	YOSHINO	Masahiro	16pB-13
	YU	Shengkai	17aB-02*
	YU	Sheng-Kai	16aA-04
	YU YU KO	Hnin	16pC-10
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	YUAN	J.	16pB-03
	YUAN	Zhimin	17aB-03
	YUAN	Zhi-Min	16aA-04
Z	ZHANG	Mingsheng	17aB-02*
	ZHANG	S.H.	15pB-05
	ZHANG	Shuyu	17pB-04*

ZHENG	Yuankai	15pA-02*
ZHONG	Lieping	15pA-01*
ZHOU	Hua	15pA-04*
ZHOU	Weidong	17aB-02*
ZHOU	Yuchen	15pB-10
ZHU	Jian-Gang	17pB-04*
ZHU	Jimmy	15pA-05*
ZHU	Xiaobin	15pA-04*
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ZOU	Xiaoxin	16pD-03
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