

Technical Program

June 7 (Monday), Morning (10:00~12:50)

10:00 Opening

10:10 Mo-1 (Plenary)

Japan's Contributions to Ion Beam Technologies

Isao Yamada

University of Hyogo

10:55 Mo-2 (Plenary)

Current and Future Trends for CMOS Technology

Devendra K Sadana

IBM, T.J. Watson Research Center

11:40 Break

12:00 Mo-3 (Invited)

Ion Implantation Requirements for Future DRAM Production

Jaesun Jeon

Samsung Electronics Co., LTD

12:30 Mo-4

Novel approach to conformal FINFET extension doping

Gerd Zschätzsch^{1,2}, Thomas Yves Hoffmann¹, Naoto Horiguchi¹, Wilfried Vandervorst^{1,2},
John Hautala³, Yan Shao³

1 IMEC

2 KU Leuven

3 TEL Epion Inc

12:50 Lunch

June 7 (Monday), Afternoon (14:20~18:00)

14:20 Mo-5 (Invited)

Advancement of CMOS Doping Technology in an External Development Framework

Amitabh Jain, James J. Chambers, Judy B. Shaw

Texas Instruments

14:50 Mo-6

Investigation of n-LDD Ultra-shallow Extension Formation using Cold and Molecular Ion Implantation

Kai Wen Ma¹, Phoenix Kuo¹, Ching I Li¹, Hsien Hsiu Lai¹, Ron Liu¹, Michael Chan¹, C. L. Yang¹, J. Y. Wu¹, M. S. Ameen², L. M. Rubin², E. Tien³, B. Chang³

1 United Microelectronics Corp., Advance Technology Development Division

2 Axcelis Technologies

3 Axcelis Technologies, Hsinchu, Taiwan

15:10 Mo-7

How can we improve sub 40nm Transistor property by using ion implantation

An Bae Lee¹, Seung woo Jin¹, Young wan Joo¹, Il sik Jang¹, Jae chun Cha¹, Ki chel Jeong¹,
Hyo sang Kang¹, Cjay Cho², Jeong hoon Jang², Sunny Hwang²

1 Hynix Semiconductor Inc.

2 Varian Korea Ltd.

- 15:30 Mo-8**
Benefits of Damage Engineering for PMOS Junction Stability
Fareen Adeni Khaja, Benjamin Colombeau, Thirumal Thanigaivelan, Deepak Ramappa, Todd Henry
Varian Semiconductor Equipment Associates
- 15:50 Mo-9**
Defectivity Study of PMOS S/D Implants on a Spot Beam High Current Implanter
JongHoon Kim¹, JongYoon Yoon¹, Leonard M Rubin¹, Michael S. Ameen¹, Ronald N. Reece¹, JC Cha², AnBae Lee², YH Joo², IS Jang², SeungWoo Jin²
¹ *Axcelis Technologies*
² *Hynix Semiconductor Inc*
- 16:10 Mo-10**
Process Characterization Of Low Temperature Ion Implantation Using Ribbon Beam And Spot Beam On The AIBT iPulsar High Current Implanter
Erik J. Collart, Ron Teel, Charles Free, Peter Kopalidis, Zhimin Wan
Advanced Ion Beam Technology, Inc
- 16:30 Break**
- 16:50 Mo-11 (Invited)**
FinFET doping ; material science, metrology, and process modelling studies, for optimised device performance
Ray Duffy
Tyndall National Institute
- 17:20 Mo-12**
Enhancement of Electron Transport Property in FET with Asymmetric Ordered Dopant Distribution
Masahiro Hori¹, Takahiro Shinada², Keigo Taira¹, Takashi Tanii¹, Yukinori Ono³, Tetsuo Endoh⁴, Iwao Ohdomari¹
¹ *School of Science and Engineering, Waseda University*
² *Waseda Institute for Advanced Study, Waseda University*
³ *NTT Basic Research Laboratories*
⁴ *Center for Interdisciplinary Research, Tohoku University*
- 17:40 Mo-13**
Conformal Doping for Fin FETs by a Novel AsH₃/Helium Self-Regulatory Plasma Doping Process
Yuichiro Sasaki¹, Katsumi Okashita¹, Shigenori Hayashi², Keiichi Nakamoto¹, Taro Kitaoka¹, Bunji Mizuno¹, Masafumi Kubota², Mototsugu Ogura², Osamu Nishijima²
¹ *Ultimate Junction Technologies Inc.*
² *Panasonic Corporation*

June 7 (Monday), Evening (18:00~20:30)
Poster Session 1
(Poster presentations are listed in the other part)

June 8 (Tuesday), Morning (9:15~12:40)

- 9:15 Tu-1 (Plenary)**
Evolution of Ion Implantation Technology and Its Contributions to the Semiconductor Industry
Katsuhiro Tsukamoto, Takashi Kuroi, Yoji Kawasaki
Renesas Technology Corporation

10:00 Tu-2 (Invited)

Ion Implantation Technology for Advanced SiC Power Devices

Tsunenobu Kimoto, Masato Noborio, Toru Hiyoshi, Koutarou Kawahara, Jun Suda
Department of Electronic Science and Engineering, Kyoto University

10:30 Tu-3

Microwave Annealing of Ion-implanted 4H-SiC

Mulpuri Venkata Rao¹, Roberta Nipoti², Syed B. Qadri³, Yonglai Tian⁴, Anindya Nath¹
1 Department of Electrical and Computer Engineering, George Mason University
2 CNR-IMM Sezione di Bologna
3 Naval Research Laboratory
4 LT Technologies

10:50 Break

11:10 Tu-4 (Invited)

Doping Technology for the Improvement of Next Generation Device Performance

K. Suguro
Toshiba Corporation

11:40 Tu-5

A study of Flash Anneal in combination with the conventional RTA for DRAM application

YoungHo Lee, JinKu Lee, MiRi Lee, SeungJoon Jeon, JaeGeun Oh, YuJun Lee, MinJung Shin, JaeYoung Kim, SeonYong Cha, Kwon Hong, SungKi Park
Hynix Semiconductor Inc.

12:00 Tu-6

Improvement of Vertical Diode Properties by N-type Plasma Doping for Low-Power Phase-Change Non-Volatile Memory (NVM)

Min Yong Lee¹, H. S. Lee¹, Y. J. Ki¹, Y. S. Sohn¹, H. S. Kang¹, C. Y. Oh², J. Y. Park², S. H. Jo²
1 R & D Division, Hynix
2 VSEA

12:20 Tu-7

Enabling solutions for 28nm pLDD and nLDD ultra-shallow junction formations

Ching I Li¹, P. Kuo¹, H. H. Lai¹, K. Ma¹, R. Liu¹, H. H. Wu¹, M. Chan¹, C. L. Yang¹, J. Y. Wu¹, B. N. Guo², B. Colombeau², T. Thirumal², E. Arevalo², T. Toh², K. H. Shim², H. L. Sun², T. Wu², Sean Lu²
1 UMC, Tainan, United Microelectronics Corp., Advance Technology Development Division
2 Varian Semiconductor Equipment Associates, Inc.

12:40 Lunch

June 8 (Tuesday), Afternoon (14:10~16:00)

14:10 Tu-8 (Invited)

Modeling of defect generation and dissolution in ion implanted semiconductors

Lourdes Pelaz, Luis A. Marqués, Iván Santos, María Aboy, Pedro López
University of Valladolid

14:40 Tu-9

The Effect of Implant Energy and Dose on Roughness and Recrystallization of Ge

Kevin S Jones¹, Blake Darby¹, Brad Yates¹, Alex Kontos²
1 University Of Florida
2 Varian Semiconductor equipment Associates

15:00 Tu-10

Density-functional theory molecular dynamics study of the threshold displacement energy and small damage pockets in Si

Eero Holmström¹, Kai Nordlund¹, Antti Kuronen², Mikko Hakala²

¹ Department of Physics and Helsinki Institute of Physics, University of Helsinki

² Department of Physics, University of Helsinki

15:20 Tu-11

Stress effects on point defect supersaturation and defect evolution

Chihak Ahn¹, Joochul Yoon¹, Nick S Bennett¹, Silke Hamm², Pier-Francesco Fazzini³, Scott T Dunham⁴, Nick E. B. Cowern¹

¹ Newcastle University

² Mattson Thermal Products

³ CNRS

⁴ University of Washington

15:40 Tu-12

High temperature ion implantation evaluation in Silicon & Germanium

Frederic Milési, Jerome Leveneur, Vincent Mazzocchi, Frederic Mazen, Frederic Gonzatti, Karim Yekache

CEA-LETI / MINATEC

June 8 (Tuesday), Afternoon (16:00~18:30)

Poster Session 2

(Poster presentations are listed in the other part)

June 9 (Wednesday), Morning (9:15~11:25)

9:15 We-1 (Invited)

Secondary Ion Mass Spectrometry and Ion Implantation: A 40-Year Marriage of Necessity

Charles W. Magee

The Evans Analytical Group

9:45 We-2

Non-Destructive Characterization of Activated Ion-Implanted Doping Profiles Based on Photomodulated Optical Reflectance

Janusz Bogdanowicz^{1,2}, Trudo Clarysse¹, Wilfried Vandervorst^{1,2}, Erik Rossee¹, Derrick Shaughnessy³

¹ IMEC

² Instituut voor Kern- en Stralingsfysika, KU Leuven

³ KLA-Tencor Corp.

10:05 We-3

The Mobility of Boron In Silicon

Simon Prussin¹, Jason Reyes¹, Shu Qin², Allen McTeer², Jeff Hu², Hiroshi Onoda³, Nariaki Hamamoto³, Tsutomu Nagayama³, Masayasu Tanjyo³

¹ Department of Electrical Engineering, University of California, Los Angeles

² Micron Technology Inc.

³ Nissin Ion Equipment Co., Ltd.

10:25 We-4

State-of-the-Art Two-Dimensional Doping Profilings of Low Energy High Dose Ion Implantations – High Vacuum Scanning Spreading Resistance Microscopy (HV-SSRM) and Electron Holography

Shu Qin¹, Yongjun Jeff Hu¹, Allen McTeer¹, David Fillmore¹, Shifeng Lu¹, Zhouguang Wang¹, Du Li¹, Rob Burke¹, Jaydip Guha¹, Danielle Vanhaeren², Pierre Eyben², Wilfred Vandervorst²

¹ Micron Technology, Inc.

² IMEC

10:45 We-5

Carrier profiling of individual Si nanowires by scanning spreading resistance microscopy

Xin Ou^{1,2}, Pratyush Das Kanungo², Reinhard Kögler¹, Peter Werner², Wolfgang Skorupa¹, Ulrich Gösele²

¹ Institute of Ion Beam Physics and Materials Research, Forschungszentrum Dresden–Rossendorf e.V.

² Max Planck Institute of Microstructure Physics

11:05 We-6

Secondary ion mass spectrometry depth profiling of organic materials with large gas cluster ion beams

Satoshi Ninomiya^{1,4}, Kazuya Ichiki², Toshio Seki^{2,4}, Takaaki Aoki^{3,4}, Jiro Matsuo^{1,4}

¹ Quantum Science and Engineering Center, Kyoto University

² Department of Nuclear Engineering, Kyoto University

³ Department of Electronic Science and Engineering, Kyoto University

⁴ CREST, Japan Science and Technology Agency (JST)

June 9 (Wednesday), Afternoon-Evening (11:25~22:00)

Excursion

Banquet

June 10 (Thursday), Morning (9:15~12:15)

9:15 Th-1

PULSION[®] HP: Tunable, High Productivity Plasma Doping

Susan B. Felch, Frank Torregrosa, Hasnaa Etienne, Yohann Spiegel, Laurent Roux, Dean Turnbaugh

Ion Beam Services

9:35 Th-2

Formation of Ultra-Shallow Junctions by Advanced Plasma Doping Techniques

George Papasouliotis, Ludovic Godet, Vikram Singh, Ryuichi Miura, Hiroyuki Ito

Varian Semiconductor Equipment Associates

9:55 Th-3

Manufacturing-Phase Application of SEN's MIND System

Shiro Ninomiya, Akihiro Ochi, Yasuhiko Kimura, Tetsuya Kudo, Mitsukuni Tsukihara, Fumiaki Sato, Genshu Fuse, Koji Ishikawa, Kazuyoshi Ueno, Michiro Sugitani

SEN Corporation

10:15 Th-4

Development of Medium Current Implanter "IMPHEAT" for SiC

Tetsuya Igo, Tadashi Ikejiri, Naoki Miyamoto, Takatoshi Yamashita

Nissin Ion Equipment Co. LTD.

10:35 Break

- 10:55 Th-5**
Dose Control in the OptimaXE Single Wafer High Energy Ion Implanter
Shu Satoh, Jonathan David
Axcelis Technologies
- 11:15 Th-6**
Demand for Image Sensor Devices on High Energy Implantation and Solution with the UHE, an Higher Energy Implanter
Noriyuki Suetsugu, Mitsukuni Tsukihara, Kazuyoshi Ueno, Michiro Sugitani
SEN corporation
- 11:35 Th-7**
Nissin's Boron and Carbon cluster ion implanter: CLARIS G2
Yoshiki Nakashima¹, Nariaki Hamamoto¹, Sei Umisedo¹, Yuji Koga¹, H. Une¹, H. Asai¹, Noriaki Maehara¹, Yoshikazu Hashino¹, Y. Kawamura¹, M. Hashimoto¹, Masayasu Tanjyo¹, Tsutomu Nagayama¹, Hiroshi Onoda¹, T. N. Horskey², S. K. Hahto²
¹ *Nissin Ion Equipment Co., Ltd.*
² *SemEquip Inc., a Ceradyne Company*
- 11:55 Th-8**
Improvements in B⁺ and BF₂⁺ Beam Currents Through the Use of Diboron Tetrafluoride (B₂F₄) Gas
Ying Tang¹, B. Campbell², P. Davidson², R. S. Santiesteban², J. Sweeney¹, R. Kaim¹, O. Byl¹, S. Yedave¹, E. Jones¹, J. McManus¹
¹ *Advanced Technology Materials Inc.*
² *Micron Technology, Inc.*
- 12:15 Lunch**
- June 10 (Thursday), Afternoon (13:45 ~18:55)
- 13:45 Th-9 (Invited)**
Enhancement of Surface Bioactivity and Biocompatibility of Materials Using Plasma, Energetic Ions, and Related Techniques
Paul K. Chu
City University of Hong Kong
- 14:15 Th-10**
A new method to fabricate optical ridge waveguides in LiNbO₃ crystals by combination of ion implantation and wet etching
Feng Chen, Yang Tan
School of Physics and State Key Laboratory of Crystal Materials, Shandong University
- 14:35 Th-11**
Hydrogen Implant for Layer Exfoliation
Sarko Cherekdjian, Gregory Couillard, Chad Wilcox
Corning Inc.
- 14:55 Break**
- 15:15 Th-12 (Invited)**
The Application of Cluster Boron Implantation to pMOSFETs
Yoji Kawasaki, Masato Ishibashi, Masashi Kitazawa, Yoshiki Maruyama, Seiichi Endo, Tomohiro Yamashita, Takashi Kuroi
Renesas Electronics Corp.

- 15:45 Th-13**
Ion Implant Enabled 2x Lithography
Patrick Michael Martin, Chris Hatem, Andrew Cheung, Gael de Cock
Varian Semiconductor
- 16:05 Th-14**
Optimization of Si:C stress retention and junction quality with ClusterCarbon implantation
Karuppanan Sekar¹, Wade Krull¹, Steve McCoy², Jeff Gelpey²
¹ *SemEquip Inc*
² *Mattson Technology Canada*
- 16:25 Th-15**
Novel Pre-silicide ion-implanted impurity for N-type Si Contacts
Wei-Yip Loh¹, Susan Felch², Hasnaa Etienne², Injo Ok¹, Dean Turnbaugh², Yohann Spiegel², Frank Torregrosa², Joel Banti², Laurent Roux², Prashant Majhi¹, Raj Jammy¹
¹ *SEMATECH*
² *Ion Beam Services*
- 16:45 Th-16**
Surface oxidation effects during low energy BF₂⁺ ion implantation
Serguei Kondratenko¹, Ronald N. Reece¹, P. K. Hsu², Hongchen Zhao²
¹ *Axcelis Technologies, Inc.*
² *Axcelis Technologies, China*
- 17:05 Break**
- 17:25 Th-17 (Invited)**
Advances in the image sensor: the critical element in the performance of cameras
Tadakuni Narabu
Sony Corporation
- 17:55 Th-18**
Ground Plane Implants for sub-32 nm Ultra-Thin Body and BOX FDSOI CMOS technology: opportunities and challenges
Konstantin K. Bourdelle
SOITEC
- 18:15 Th-19**
Plasma implantation technology for upcoming ultra shallow and highly doped fully depleted silicon on insulator transistors
Frederic Gonzatti¹, Frederic Milési¹, Delaye Vincent¹, Julian Duchaine², Frank Torregrosa², Hasnaa Etienne², Karim Yckache¹
¹ *CEA-LETI MINATEC*
² *Ion Beam Services*
- 18:35 Th-20**
Achieving Uniform Device Performance by Using Advanced Process Control and SuperScan
Christian Krueger¹, Thomas Feudel¹, Youn-ki Kim², John Flanagan², Thirumal Thanigaivelan², Zhiyong Zhao²
¹ *Globalfoundries Dresden*
² *Varian Semiconductor Equipment Associates*

June 11 (Friday), Morning (9:15 ~11:55)

9:15 Fr-1 (Invited)

Extended defects evolution in ion implanted SiGe alloys and Germanium

Pier Francesco Fazzini¹, El Mehdi Bazizi¹, Federico Panciera¹, Silke Paul², Wilfried Lerch²,
Ardechir Pakfar³, Chihak Ahn⁴, Nick Bennett⁴, Nicholas E. B. Cowern⁴, Jean Michel
Hartmann⁵, Fuccio Cristiano¹

1 *LAAS-CNRS*

2 *Mattson Thermal Products*

3 *STMicroelectronics*

4 *Newcastle University*

5 *CEA-LETI*

9:45 Fr-2

Converting Polycrystals into Single Crystals: Tuning of the Thin Film Microstructure by High and Low Energy Ion Bombardment

Matteo Seita, Ke Zeng, Sven Olliges, Ralph Spolenak

ETH Zurich, Department of Materials, Lab. of Nanometallurgy

10:05 Fr-3

Ion beam induced damage recrystallization from a nanocalorimetric point of view

Yonathan Anahory, Matthieu Guihard, Dries Smeets, Francois Schiettekatte

Department of Physics, University of Montreal

10:25 Fr-4 (Invited)

Single Ion Implanted Donor Devices for Quantum Information Processing

Edward Bielejec, K. Eng, N. Bishop, B. L. Doyle, M. S. Carroll

Sandia National Laboratories

10:55 Fr-5

Suppression of divergence of low energy ion beams by space charge neutralization with low energy electrons emitted from field emitter arrays

Junzo Ishikawa¹, Yasuhito Gotoh², Mitsuaki Takeuchi³, Shuhei Taguchi², Dan Nicolaescu²,
Hiroshi Tsuji², Tsunenobu Kimoto², Shigeki Sakai⁴

1 *Chubu University*

2 *Kyoto University*

3 *JST Innovation Plaza Kyoto*

4 *Nissin Ion Equipment Co., Ltd.*

11:15 Fr-6

Sources and Transport Systems for Low Energy Extreme of Ion Implantation

Ady Itzhak Hershcovitch¹, V. A. Batalin², Alexei S. Bugaev³, Vasily I. Gushenets³, Oleg
Aleksenko⁴, E. Gurkina⁴, B. M. Johnson¹, A. A. Kolomiets², G. N. Kropachev², R. P.
Kuibeda², T. V. Kulevoy², E. S. Masunov⁵, E. M. Oks³, V. I. Pershin², S. M. Polozov⁵, H. J.
Poole⁶, D. N. Seleznev², P. A. Storozhenko⁴, A. Vizir³, A. Ya. Svarovski⁷, P. Yakushin³, G.
Yu. Yushkov³

1 *Brookhaven National Laboratory*

2 *Institute for Theoretical and Experimental Physics*

3 *High Current Electronics Institute Russian Academy of Sciences*

4 *State Research Institute for Chemistry and Technology of Organoelement Compounds*

5 *Moscow Engineering Physics Institute*

6 *PVI*

7 *Siberian Divisions of Russian National Research Center*

11:35 Closing

Poster Session 1: June 7 (Monday) 18:00~20:30

P1-1

True Zero Implants

Shengwu Chang, Venkataramana Chavva, Frank Sinclair
Varian Semiconductor Equipment Associates

P1-2

Aluminum Ion Beam Production for Medium Current Implanter

Naoki Miyamoto, Tetsuya Igo, Tadashi Ikejiri, Takatoshi Yamashita
Nissin Ion Equipment Co.LTD.

P1-3

Development of a Compact Ion Source with a Hot Hollow Cathode

Naoki Miyamoto¹, Yasuhiro Demura², Shinsuke Imakita², Toshiro Kasuya², Magdaleno R. Vasquez Jr.², Motoi Wada²
1 Nissin Ion Equipment Co.LTD.
2 Graduated School of Engineering, Doshisha University

P1-4

Ion Beam Sweeping using High Temperature Super Conducting Magnet

Shigeki Sakai¹, Tom King², Hideki Fujita¹, Donald Pooke²
1 Nissin Ion Equipment co., ltd
2 HTS-110

P1-5

Development of high productivity medium current ion implanter "EXCEED 3000 Evolution"

Tadashi Ikejiri, Nariaki Hamamoto, S. Hisada, Koji Iwasawa, K. Kawakami, Keiichi Kokuryu, Naoki Miyamoto, Takashi Nogami, Takashi Sakamoto, Yukio Sasada, Kohei Tanaka, Yoshiyuki Yamamoto, Takatoshi Yamashita
Nissin Ion Equipment Co., LTD.

P1-6

A Productivity Improvement Method on SEN's Single-Wafer High-Current Ion Implanter, the SHX Series

Shiro Ninomiya, Akihiro Ochi, Yasuhiko Kimura, Toshio Yumiyama, Tetsuya Kudo, Takeshi Kurose, Hiroyuki Kariya, Mitsukuni Tsukihara, Koji Ishikawa, Kazuyoshi Ueno
SEN Corporation

P1-7

Introducing the Optima MDx Medium Dose Implanter

Perry Justesen, Richard Rzeszut, Robert D Rathmell
Axcelis Technologies, Inc.

P1-8

Defect Engineering on a Spot Beam Implanter for sub-60nm DRAM

WonMin Moon¹, Dugeun Song¹, Kyung-Won Lee², Leonard M. Rubin³
1 Samsung Electronics
2 Axcelis Technologies Korea
3 Axcelis Technologies

P1-9

Contamination Control in Ion Implantation - An Additional Approach

David T. Doi¹, Ronald J. Eddy², Israel Santos³, Walt Wriggins³
1 Fast Gate Corp.
2 KLE Engineering
3 Core Systems

P1-10

Characterization of Boron Contamination in Fluorine Implantation using Boron Trifluoride as a Source Material

Matthias Schmeide¹, Ben Rosam², Serguei Kondratenko³

¹ Infineon Technologies Dresden GmbH

² Infineon Technologies AG

³ Axcelis Technologies, Inc.

P1-11

Simulation of finite sheath collision effect on plasma immersion ion implantation process of several cylinders

Yang Lu, Langping Wang, Zhiwen Xie, Lei Huang, Xiaofeng Wang

State key laboratory of advanced welding production technology, Harbin Institute of Technology

P1-12

Investigation of Methods to Improve Ion Source Life for Germanium Implantation

Joseph D Sweeney, Steven Sergi, Ying Tang, Oleg Byl, Sharad Yedave, Robert Kaim

ATMI

P1-13

Use of Xenon Difluoride to Clean Hazardous By-Products in Ion Implanter Source Housings, Turbo Pumps, and Fore-lines

Joseph R. Despres, Barry Chambers, Steve Bishop, Robert Kaim, Shkelqim Letaj, Steve Sergi, Joseph Sweeney, Ying Tang, Sharad Yedave

ATMI

P1-14

Improving Ion Implanter Productivity with *in-situ* Cleaning

Steve Bishop¹, Al Perry²

¹ ATMI

² Analog Devices

P1-15

Source Lifetime Improvements for VIISa Series Implanters

Fleurette Tapado¹, Dustin R. Hacker², Tim A. Vaughan², Joseph Chan³

¹ Texas Instruments

² Plansee/Electro-Graph, Inc.

³ Plansee Japan Ltd.

P1-16

Alternative Type 1 Sub-Atmospheric Gas Sources

Graham McFarlane¹, Christopher Hartz¹, Kee-Chan Kim¹, Ce Ma¹, Jon Merrill², Ron Capodilupo²

¹ Linde LLC

² Axcelis Technologies Inc.

P1-17

Boron and other possible ion implantations by use of the cathodic arc ion source.

D. J. Chivers¹, J. M. Williams², C. C. Klepper², R. C. Hazelton³, E. P. Carlson³

¹ Brontek Delta Corporation, UK

² Brontek Delta Corporation, USA

³ HY-Tech Research Corporation

P1-18

Polyatomic Ion Source with Ionic Liquid for Shallow Implantation

Mitsuaki Takeuchi, Hiromichi Ryuto, Gikan H Takaoka

Kyoto University, Photonics and Electronics Science and Engineering Center

P1-19

Optimization of compact microwave ion source for generation of high current and low energy ion beam

Shuhei Taguchi¹, Yasuhito Gotoh¹, Hiroshi Tsuji¹, Shigeki Sakai², Junzo Ishikawa³

¹ *Kyoto University*

² *Nissin Ion Equipment Co., Ltd.*

³ *Chubu University*

P1-20

Transfer from Rs-based to PMOR-based Ion Implantation Process Monitoring

Gerrit Smets¹, Erik Rosseel¹, Gunther Sterckx¹, Janusz Bogdanowicz^{1,2}, Wilfried Vandervorst^{1,2}, Derrick Shaunessy³

¹ *IMEC*

² *Instituut voor Kern- en Stralingsfysika, KU Leuven*

³ *KLA-Tencor Corp.*

P1-21

Detection of energy contamination in ion implants using non-contact characterization methods

Miklos Tallian, Aron Pap, Kalman Mocsar, Andras Somogyi, Gyorgy Nadudvari, David Kosztka, Tibor Pavelka

Semilab Semiconductor Physics Laboratory Co. Ltd.

P1-22

Control of Source and Drain Extension Phosphorus Profile by Using Carbon Co-implant

Phoenix Kuo, Ching I Li, Rubby Shi, Kevin Ma, Hsien-Hsiu Lai, Hsin-Huei Wu, Michael Chan, Chan Lon Yang, J. Y. Wu

UMC, Tainan, United Microelectronics Corp., Advance Technology Development Division

P1-23

Larger ClusterBoron (B₃₆H_x) Implant for USJ applications

Karuppanan Sekar¹, Wade Krull¹, Karim Huet², Celia Boniface², Julien Venturini²

¹ *SemEquip Inc*

² *Excico France*

P1-24

USJ with ClusterBoron and ClusterCarbon Co-implants

Karuppanan Sekar, Wade Krull

SemEquip Inc

P1-25

Optimization and Control of Plasma Doping Processes

George Pappasoulis, Deven Raj, Kamal Hadidi, Ludovic Godet, Vikram Singh

Varian Semiconductor Equipment Associates

P1-26

Process sequence dependence in dual-step source/drain annealing scheme for ultra-shallow boron junction formation

Chyiu Hyia Poon, Alex See, Meisheng Zhou

GLOBALFOUNDRIES, Technology Development and R&D

P1-27

High Dose Boron Implants - Modification of Device Parameters through Implant Temperature Control

Matthias Schmeide¹, Michael S. Ameen², S. Kondratenko², B. Krimbacher², R. Reece²

¹ *Infineon*

² *Axcelis Technologies*

P1-28

Control of Implant Damage for sub-45 nm Device Fabrication

M. S. Ameen, L. M. Rubin, M. A. Harris, W. D. Lee, R. N. Reece
Axcelis Technologies

P1-29

Recrystallization and Activation of Silicon Implanted with Phosphorus Atoms by Rapid Annealing Using Infrared Semiconductor Laser

Toshiyuki Sameshima¹, Yasushi Kanda¹, Kan Ukawa¹, Masahiko Hasumi¹, Naoki Sano², Masao Naito³, Nariaki Hamamoto³

¹ *Tokyo University of Agriculture and Technology*

² *Hightec Systems Corporation*

³ *Nissin Ion Equipment Co.,Ltd*

P1-30

Cluster Ion Implantation for Process Application

Masayasu Tanjo¹, H. Onoda¹, T. Nagayama¹, N. Hamamoto¹, S. Umisedo¹, Y. Koga¹, H. Une¹, N. Maehara¹, Y. Kawamura¹, Y. Hashino¹, Y. Nakashima¹, M. Hashimoto¹, N. Tokoro¹, N. Nagai¹, K. Sekar², W. Krull²

¹ *Nissin Ion Equipment Co.,Ltd.*

² *SemEquip Inc*

P1-31

IMC-200 Series from IBS: Ion implanters and applications for SiC doping

Stéphane Morata, Gilles Mathieu, Frank Torregrosa, Grégory Grosset, Gilles Boccheciampe, Thierry Bouchet

Ion Beam Services

P1-32Physical and electrical characterization of 110 nm and 90 nm technology node devices using Plasma Doping with PULSION[®]

Frank Torregrosa¹, Yohann Spiegel¹, Hasnaa Etienne¹, Susan Felch¹, Laurent Roux¹, Dean Turnbaugh¹, P. Roux², Catherine Grosjean², F. Figarols², P. Maillot², O. Pizzuto², J. L. Ogier¹, J. Dellaleau¹

¹ *Ion Beam Services*

² *ST Microelectronics*

P1-33Optimization of Etching/Deposition Phenomena for BF₃ and B₂H₆ Plasma Doping using PULSION[®]

Susan B. Felch¹, Hasnaa Etienne¹, Yohann Spiegel¹, Frank Torregrosa¹, Julian Duchaine¹, Laurent Roux¹, Dean Turnbaugh¹, Sandeep Mehta²

¹ *Ion Beam Services*

² *Axcelis Technologies*

P1-34

A Comparative Study Of Dopant Activation And Deactivation In Boron Implanted Silicon

Shu Qin¹, Allen McTeer¹, Jeff Hu¹, Simon Prussin², Jason Reyes²

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P1-35

A Comparative Study Of Dopant Activation And Deactivation In Phosphorus and Arsenic Implanted Silicon

Shu Qin¹, Allen McTeer¹, Jeff Hu¹, Simon Prussin², Jason Reyes²

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P1-36

Implant Damage Studies with Different Implant Temperature by Spot and Ribbon Beam

Hank Chen, Causon Jen, Tony Lin

Advanced Ion Beam Technology

P1-37

Charge accumulation in N⁺-ion modified buried SiO₂ layer of n-type SOI structure

Ida E. Tyschenko, Vladimir P. Popov

Institute of Semiconductor Physics

P1-38

Ion-beam synthesis of InSb nanocrystals within the buried SiO₂ layer of silicon-on-insulator structure

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P1-39

Post-implantation Evolution of Hydrogen Related Defects in Silicon

Liviu Bîlteanu¹, Thomas Jourdan¹, Névine Rochat², Aurélie Tausin², Frédéric Mazen², Florence

Madeira², Jean-Paul Crocombette¹

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² *CEA, LETI, MINATEC*

P1-40

Investigation of local order around Arsenic atoms in Silicon in ultra shallow junctions formed by beamline and plasma immersion ion implantation and laser annealing

Giancarlo Pepponi¹, Florian Meirer², Mehmet Alper Sahiner³, Damiano Giubertoni¹, Salvatore

Gennaro¹, Evgeny Demenev¹, Massimo Bersani¹, Majeed A Foad⁴, Christina Strel², Piero Pianetta⁵

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⁴ *Advanced Technology Group, CTO Office, Applied Materials Inc.*

⁵ *SSRL*

P1-41

Luminescence Studies of Residual Damage in Low-Dose Arsenic Implanted Silicon after High-Temperature Annealing

Akihiko Sagara¹, Miori Hiraiwa¹, Satoshi Shibata¹, Ryuichi Sugie², Keiichi Yamada²

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² *Toray Research Center, Inc.*

P1-42

High temperature phosphorus ion implantation in germanium

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P1-43

Luminescence properties of germanium-implanted silicon dioxide layer and Ge oxidation states after different annealing

Hiroshi Tsuji¹, Nobutoshi Arai², Syohei Kinoshita¹, Yasuhito Gotoh¹, Junzo Ishikawa³, Masatomi Harada², Hiroshi Kotaki²

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² *Sharp Corporation*

³ *Chubu University*

P1-44

Photoluminescence of ZnO wafers implanted with 60 keV Sn⁺ ions to doses from 2×10^{14} to 1.5×10^{15} cm⁻² at 112 K and room temperature.

Giang T. Dang¹, Toshiyuki Kawaharamura², Takashi Hirao², Noriko Nitta³, Masafumi Taniwaki¹
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2 *Research Institute for Nano-devices, Kochi University of Technology*
3 *Department of Electrical and Electronic Engineering, Kobe University*

P1-45

Stable ultraviolet cathodoluminescence from fused silicon dioxide (SiO₂) doped with atomic (C⁺) and molecular (C₂⁺) carbon ions

Mihir Sarkar, Surajit Sarkar, Nitul Sing Rajput, Nobin Banerjee, Vishwas Narhar Kulkarni, S. Dhamodaran
Department of Physics, IIT Kanpur

P1-46

First-principles Examination of As 3d_{5/2} X-ray Photoelectron Spectrum for Heavily Doped Arsenic Shallow Junctions Prepared by Plasma Doping

Kanae Ban-i, Takuya Maruizumi
Department of Electrical and Electronic Engineering, Tokyo City University

P1-47

Erosion of Extraction Electrodes of Ion Sources due to Sputtering

Takahiro Kenmotsu¹, Naoki Miyamoto², Motoi Wada¹
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2 *Nissin Ion Equipment Co. Ltd*

P1-48

Calculations of Molecular Effect in Si on the base of Threshold Density of Collision Cascades

Platon A. Karaseov¹, Andrei I. Titov¹, Alexander Yu. Azarov², Sergey O. Kucheyev³
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2 *Department of Physics, University of Oslo*
3 *Lawrence Livermore National Laboratory*

P1-49

Buried Highly Conductive Layer in Diamond Formed by High Dose Hydrogen Implantation and Annealing

Vladimir P. Popov¹, Olga V. Naumova¹, Leonid N. Safronov¹, Vladimir A. Volodin¹, Grigory P. Pokhil², Igor N. Kupriyanov³, Yury N. Palyanov³
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2 *MSU Skobeltsyn Institute of Nuclear Physics*
3 *Institute of Geology and Mineralogy*

P1-50

Ion Implanted GaAs Detectors for Registration of Heavy Charged Particles and γ -quantums.

Gennady I. Koltsov, Sergey I. Didenko, Aleksey V. Chernykh, Sergey V. Chernykh, Aleksey V. Sidelev, Valentina A. Bogushevskaj
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P1-51

Optical, structural and electrical studies of the gallium antimonide irradiated with swift (100 MeV) iron ions

Vidya Jadhav, S. K. Dubey, A. D. Yadav
Department of Physics, University of Mumbai

P1-52

Deep doping profiles in silicon created by MeV hydrogen implantation: Influence of implantation parameters

Johannes G. Laven¹, Hans-Joachim Schulze², Volker Häublein³, Franz-Josef Niedernostheide², Holger Schulze⁴, Heiner Ryssel^{1,3}, Lothar Frey^{1,3}

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3 *Fraunhofer Institute for Integrated Systems and Device Technology*

4 *Infineon Technologies Austria AG*

P1-53

Surface Modification using Highly Charged Ions

Makoto Sakurai¹, Ken Asakura¹, Naoyuki Iida¹, Shengjin Liu¹, Masahide Tona¹, Toshifumi Terui²

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2 *National Institute of Information and Communications Technology*

P1-54

Simultaneous sterilization with surface modification of plastic bottle by plasma-based ion implantation

Noriyuki Sakudo, N. Ikenaga, F. Ikeda, Y. Nakayama, Y. Kishi, Z. Yajima

Kanazawa Institute of Technology

P1-55

Growth of GaN thin film using NH₃ cluster ion beam on Si(111) cleaned using Ar cluster ion beam

Shun-ichiro Nakagawa¹, Hiroshi Saito¹, Masakazu Ohishi¹, Kazuaki Imai²

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2 *Department of Electric and Electronic Engineering, Hokkaido Institute of Technology*

P1-56

Ultra-thin surface modification with nitrogen gas cluster ion beams

Noriaki Toyoda, Takafumi Mashita, Isao Yamada

Graduate school of engineering, University of Hyogo

P1-57

Vacuum pressure dependence on surface reactions induced by gas cluster ions studied with in-situ XPS

Takanori Suda, Noriaki Toyoda, Motohiro Nakagiri, Isao Yamada

Graduate School of Engineering, University of Hyogo

P1-58

Size and energy dependence of the sputtering yield of Si bombarded with gas cluster ion beams

Kazuya Ichiki¹, Satoshi Ninomiya^{2,4}, Toshio Seki^{1,4}, Takaaki Aoki^{3,4}, Jiro Matsuo^{2,4}

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P1-59

Damage evaluation of organic materials irradiated with Ar cluster ion beam

Yasuyuki Yamamoto¹, Kazuya Ichiki¹, Satoshi Ninomiya^{2,4}, Toshio Seki^{1,4}, Takaaki Aoki^{3,4}, Jiro Matsuo^{2,4}

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P1-60

Engineering of the silicon nanocrystal ensembles in SiO₂ matrix by energetic ions

Irina V. Antonova¹, Vladimir A. Skuratov², Isaak Balberg³

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² Joint Institute for Nuclear Research, Dubna

³ The Racah Institute of Physics, The Hebrew University

P1-61

Electrocatalytic layers formed on titanium substrates with application of ion-beam technology

Vasily V. Poplavsky¹, Tatiana S. Stelmah¹, Vladimir G. Matys²

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² Belarusian State University of Technology, Department of Electrochemistry

P1-62

Magnetic nanoclusters at the surface of silica: from ion beam implantation to magnetic sensing devices

Jerome Leveneur¹, John V. Kennedy¹, John Futter¹, Grant V. M. Williams², Andreas Markwitz¹,

James Metson³

¹ GNS Science, National Isotope Centre

² The MacDiarmid Institute, Industrial Research

³ Department of Chemistry, The University of Auckland

P1-63

Memory and electroluminescence properties of silicon nanocrystal MOS-FETs

Bernd Schmidt, Karl-Heinz Heinig, Volkhard Beyer

Research Center Dresden-Rossendorf, Institute of Ion Beam Physics and Materials Research

P1-64

Amorphization of embedded Ge and Si nanocrystals in amorphous silica under ion irradiation in MeV energy range

Flyura Djurabekova¹, Marie Backman¹, Olli H. Pakarinen¹, Kai Nordlund¹, Boris Leonidovich

Oksengendler^{2,3}, Sergei E. Maksimov²

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³ Institute of Physics and Chemistry of polymers

P1-65

Deuterium uptake in iron oxide (Fe₂O₃) under D₂⁺-plasma exposure

Takahiro Sogawa¹, N. Matsunami¹, N. Ohno², M. Tokitani³, S. Masuzaki³

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² Energy Engineering and Science, Graduate School of Engineering

³ National Institute for Fusion Science

P1-66

Advanced SIMS Quantification in the first few nm of B, P and As Ultra Shallow Implants

Alex Merkulov, Joan Choi, Paula Peres, Francois Horreard, Michel Schuhmacher

CAMECA

P1-67

Local Resistance Profiling of Ultra Shallow Junction Annealed with Combination of Spike Lamp and Laser Annealing Processes using Scanning Spreading Resistance Microscope

Satoshi Abo¹, Kazuhisa Nishikawa¹, Naoya Ushigome¹, Fujio Wakaya¹, Toshiaki Iwamatsu²,

Hidekazu Oda², Mikio Takai¹

¹ Center for Quantum Science and Technology under Extreme Conditions, Osaka University

² Renesas Technology Corporation

P1-68

SIMS with Fast Heavy Ions for Biomolecule Analysis

Yoshinobu Wakamatsu¹, Hideaki Yamada¹, Satoshi Ninomiya^{2,4}, Toshio Seki^{1,4}, Takaaki Aoki^{3,4}, Jiro Matsuo^{2,4}

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4 CREST, Japan Science and Technology Agency

Poster Session 2: June 8 (Tuesday) 16:00~18:30

P2-1

Challenges and Unique Enabling Ion Implanter Solutions for Sub 4x nodes

N. Khasgiwale, C. Campbell, T. Henry
Varian Semiconductor Equipment Associates

P2-2

Next Generation Medium Current Product: VISta[®] 900XPT

Dennis Rodier, Joseph C. Olson
Varian Semiconductor Equipment Associates, Inc.

P2-3

Ribbon and Spot Beam Process Performance of the Dual Mode iPulsar High Current Ion Implanter

Peter M Kopalidis, Zhimin Wan, Erik Collart
Advanced Ion Beam Technology, Inc.

P2-4

Properties of Diboron Tetrafluoride (B₂F₄), a New Gas for Boron Implantation

Oleg Byl, Edward Jones, Joseph Sweeney, Robert Kaim
ATMI

P2-5

Improving Sustainability of Ion Implant Modules: An Analysis and Implementation Plan for Energy and Capital Equipment Savings.

Jim John Mayer
ATMI, Inc.

P2-6

Universal Cluster Source

Thomas N. Horsky, Sami K. Hahto, Edward K. McIntyre
SemEquip, Inc.

P2-7

Angle Performance on Optima XE

Jonathan David, Shu Satoh
Axcelis Technologies, Inc.

P2-8

Process performance of Optima XE single high energy system

JongHoon Kim¹, JongYoon Yoon¹, Serguei Kondratenko¹, JC Cha², YH Joo², AnBae Lee²,
SeungWoo Jin²
¹ *Axcelis Technologies*
² *Hynix Semiconductor Inc*

P2-9

Optima HDx: A Single Wafer, Spot Beam, High Current Ion Implantation System

Mark A. Harris, Edward Eisner, Geum Joo Ra, Scott Trinh, Scott Barusso, Aubrey Chappell, Ron Reece
Axcelis Technologies, Inc.

P2-10

Development of a Plasma Sputter-type Ion Source for Extracting Low-energy Gallium Ions
Magdaleno Rigodon Vasquez Jr.¹, Toshiro Kasuya¹, Shuichi Maeno², Naoki Miyamoto³, Motoi Wada¹

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³ Nissin Ion Equipment Co. Ltd.

P2-11

Multi-Frequencies Microwaves Plasma Production for Active Profile Control of Ion Beams on a Large Bore ECR Ion Source with Permanent Magnets

Naoki Sakamoto, Yushi Kato, Fuminobu Sato, Toshiyuki Iida

Osaka University

P2-12

Mass Filtering Function of Magnetic Boundaries in Multi-Cusp Ion Source

Yutaka Inouchi, Shojiro Dohi, Masahiro Tanii, Masashi Konishi, Masao Naito

Nissin Ion Equipment Co., Ltd.

P2-13

Accurate Dose Distribution Control under Pressure Variation Caused by Photoresist Outgassing for Low Temperature Polycrystalline-silicon TFT

Takeshi Matsumoto, Makoto Konushi, Kohichi Orihira, Yoshiyuki Nakazawa, Masatoshi Onoda, Kazuhiro Nakao, Yutaka Inouchi, Junichi Tatemichi, Masashi Konishi, Masao Naito

Nissin Ion Equipment Co., Ltd, FPD Machine Business Center

P2-14

NISSIN Ion Doping System - H₂⁺ implantation for silicon layer exfoliation

Sarko Cherekdjian¹, Richard Maschmeyer¹, Jeff Cites¹, Junichi Tatemichi², Yutaka Inouchi², Masatoshi Onoda², Kohichi Orihira², Masashi Konishi², Masao Naito²

¹ Corning Inc.

² NISSIN Ion Equipment Co.

P2-15

Implant monitoring measurements on ultra shallow implants before and after anneal using Photomodulated Reflection and Junction Photovoltage measurement techniques

Miklos Tallian, Aron Pap, Kalman Mocsar, Andras Somogyi, Gyorgy Nadudvari, David Kosztka, Tibor Pavelka

Semilab Semiconductor Physics Laboratory Co. Ltd.

P2-16

Leakage current measurements by Junction Photovoltage technique

Miklos Tallian, Aron Pap, David Kosztka, Tibor Pavelka

Semilab Semiconductor Physics Laboratory Co. Ltd.

P2-17

Ion source of pure single charged boron based on planar magnetron discharge in self-sputtering mode

A. V. Vizir¹, V. I. Gushenets¹, A. Hershcovitch², T. V. Kulevoy³, E. M. Oks¹, G. Yu. Yushkov¹

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² Brookhaven National Laboratory

³ Institute for Theoretical and Experimental Physics

P2-18**Molecular Ion Beam Source for Low Energy Ion Implantation**

Timur V. Kulevoy¹, D. N. Seleznev¹, P. E. Yakushin¹, G. N. Kropachev¹, R. P. Kuibeda¹, A. V. Kozlov¹, A. Hershcovitch², O. Alexeenko⁴, E. Gurkova⁴, S. Dugin⁴, B. M. Johnson², V. I. Gushenets³, E. M. Oks³, H. J. Poole⁵, P. A. Storozhenko⁴

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3 *High Current Electronics Institute Russian Academy of Sciences*

4 *State Research Institute for Chemistry and Technology of Organoelement Compounds*

5 *PVI*

P2-19**Molecular Ion Beam Transportation for Low Energy Ion Implantation**

Timur V. Kulevoy¹, G. N. Kropachev¹, D. N. Seleznev¹, P. E. Yakushin¹, R. P. Kuibeda¹, A. V. Kozlov¹, V. A. Koshelev¹, A. Hershcovitch², V. I. Gushenets³, B. M. Johnson², E. M. Oks³, S. M. Polozov⁴, H. J. Poole⁵

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3 *High Current Electronics Institute Russian Academy of Sciences*

4 *Moscow Engineering Physics Institute*

5 *PVI*

P2-20**Synthesis of endohedral fullerene using ECR ion source**

Hidekazu Minezaki¹, Takashi Uchida², Kiyokatsu Tanaka³, Masayuki Muramatsu⁴, Toyohisa Asaji³, Yushi Kato⁵, Atsushi Kitagawa⁴, Richard Racz⁶, Sandor Biri⁶, Yoshikazu Yoshida²

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3 *Tateyama Machine Co., Ltd.*

4 *National Institute of Radiological Sciences(NIRS)*

5 *Graduate school of engineering, Osaka university*

6 *Institute of nuclear research (ATOMKI)*

P2-21**Collimator magnet with functionally defined profile for ion implantation**

Dan Nicolaescu¹, Shigeki Sakai², Yasuhito Gotoh¹, Junzo Ishikawa³

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2 *Nissin Ion Equipment Co., Ltd.*

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P2-22**Ion beam neutralization using FEAs and mirror magnetic fields**

Dan Nicolaescu¹, Shigeki Sakai², Yasuhito Gotoh¹, Junzo Ishikawa³

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3 *Department of Electronics and Information Engineering, Chubu University*

P2-23**Development of high-intensity Ar cluster ion beam equipment**

Takafumi Yamanobe¹, Yasuyuki Yamamoto¹, Kazuya Ichiki¹, Satoshi Ninomiya^{2,4}, Toshio Seki^{1,4}, Takaaki Aoki^{3,4}, Jiro Matsuo^{2,4}

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P2-24

Robust Boron Ion Implantation Profile Database with an Energy Range of 0.5 to 2000 keV Based on Accurate SIMS Data and Calibrated Monte Carlo Simulation Tracing to Virtual Negative Plane

Kunihiko Suzuki¹, Yoko Tada¹, Yuji Kataoka¹, Shuichi Kojima²

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² *Fujitsu LSI Technology*

P2-25

Intrawafer dose gradients for process optimization

Peter M Banks¹, Marek Braun², Kevin Faulkner¹, Rastislav Kocis²

¹ *Applied Materials Inc.*

² *GlobalFoundries*

P2-26

Formation of Shallow PN junction by Cluster Boron Implantation and Rapid Annealing Using Infrared Semiconductor Laser

Masahiko Hasumi¹, Kan Ukawa¹, Toshiyuki Sameshima¹, Naoki Sano², Masao Naito³, Nariaki Hamamoto³

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² *Hightec Systems Corporation*

³ *Nissin Ion Equipment Co.,Ltd.*

P2-27

A Deep Level Transient Spectroscopy Study on Recrystallization of Ultra-Shallow Implanted Silicon

Masashi Okutani¹, Shuhei Takashima¹, Masahiro Yoshimoto¹, Woo Sik Yoo²

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² *WaferMasters, Inc.*

P2-28

Amorphizing HALO Implantation (AHI) & Laser Annealing For 22nm Node p+ USJ

John Ogawa *Borland*

J.O.B. Technologies

P2-29

Ion Implantation-based New Generation Rapid Thermal Process (RTP) Method and System for Semiconductor Fabrication

Shu Qin

Micron Technology, Inc.

P2-30

Demonstration of cost-effective, highly productive Ultra-Shallow Junctions using Molecular Carbon and Boron as an alternative to Ge/C/B Implantation

Daniel R. Tieger¹, M. S. Ameen¹, M. A. Harris¹, T.-J. Hsieh¹, W. A. Krull²

¹ *Axcelis Technologies*

² *SemEquip*

P2-31

Extension of the Si:C stressor thickness by using multiple ClusterCarbon species

Karuppanan Sekar, Wade Krull

SemEquip Inc

P2-32Photo-Induced Carrier Recombination Properties of Silicon caused by $2H^+$ Implantation

Yuko Fujimoto¹, Junichi Tatemichi¹, Yutaka Inouchi¹, Masao Naito¹, Tomokazu Nagao², Masahiko Hasumi², Toshiyuki Sameshima²

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P2-33

Charge carrier depth profiling of boron doped single crystalline silicon by Stepwise Oxidation Profiling (SWOP)

Peter Philipp, Bernd Schmidt, Michael Zier

Research Center Dresden-Rossendorf, Institute of Ion Beam Physics and Materials Research

P2-34

Lanthanoid Implantation for Effective Work Function Control in NMOS High-k / Metal Gate Stacks

Azinwi Fet¹, Volker Häublein¹, Anton J. Bauer¹, Heiner Ryssel^{1,2}, Lothar Frey^{1,2}

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P2-35

Improvement of Poly Profile in sub 30nm Device By Damage Engineering and Tilted Implant Method

Chul-Young Ham¹, Noh-Yeal Kwak¹, Sang-Soo Lee¹, Seung-Woo Shin¹, Min-Sung Ko¹, Jae-Mun Kim¹, Byung-Seok Lee¹, Jin-Woong Kim¹, Choong-Young Oh², Yong-Su Kim², Benjamin Colombeau³

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P2-36

Effect of carbon plasma immersion ion implantation on the thermal stability of nickel silicide film

Chen-Ming Lee¹, Tzu-Hsin Lo¹, Bing-Yue Tsui¹, Yu-Chen Li², Wen-Fa Tsai², Chi-Fong Ai²

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² Atomic Energy Council, Institute of Nuclear Energy Research, Physics Division

P2-37

Multi-Wavelength Raman and Photoluminescence Characterization of Implanted Silicon Before and After Rapid Thermal Annealing

Woo Sik Yoo, Takeshi Ueda, Toshikazu Ishigaki, Kitaek Kang

WaferMasters, Inc.

P2-38

Non-Contact and Non-Destructive Characterization of Ultra-Shallow Implanted Silicon PN Junctions using Ultra-Violet Raman Spectroscopy

Masashi Fukumoto¹, Noriyuki Hasuie¹, Hiroshi Harima¹, Masahiro Yoshimoto¹, Woo Sik Yoo²

¹ Kyoto Institute of Technology

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P2-39

Implant Strategies for InGaAs Ultra-Shallow Junctions

Richard Hill¹, P. Y. Hung¹, Susan Felch², Hasnaa Etienne², Johann Spiegel², Frank Torregrosa², R. Droopad³, Raj Jammy¹

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P2-40

Comparison of different characterization techniques for plasma implanted samples having highly doped and shallow implanted layers: Total dose, profile, etching and deposition characterizations

Frank Torregrosa¹, Catherine Grosjean², Mona Moret³, Y. Depuydt⁴, Yohann Spiegel¹, Hasnaa Etienne¹, Susan Felch¹, Julian Duchaine¹, Laurent Roux¹, B. Bortolotti³, R. Daineche⁵

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2 *ST Microelectronics*

3 *CAMECA*

4 *BIOPHY Research*

5 *Université Paul Cézanne*

P2-41

Different Profile Responses to Dose Variation for B₂H₆ and BF₃ Plasma Doping using PULSION[®]

Frank Torregrosa¹, Yohann Spiegel¹, Hasnaa Etienne¹, Susan Felch¹, Julian Duchaine¹, Laurent Roux¹, Dean Turnbaugh¹, Sandeep Mehta²

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2 *Axcelis Technologies*

P2-42

New Mechanisms for Photostimulated Boron Diffusion In Crystalline Si

Yevgeniy V. Kondratenko, Charlotte T.M. Kwok, Edmund G Seebauer

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P2-43

Ion-Induced Damage at Si-SiO₂ Interfaces: Implications for Defect Engineering

Yevgeniy V. Kondratenko, Charlotte T.M. Kwok, Edmund G Seebauer

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P2-44

Stable position of a boron cluster near Si surface

Shunsuke Ito, Takuya Maruizumi

Tokyo City University

P2-45

Stress-induced nucleation of nanoislands during the growth of Ge/Si heterostructures under low-energy ion irradiation

Zhanna V. Smagina, Pavel L. Novikov, Vladimir A. Zinoviev, Vladislav A. Armbrister, Sergey A. Teys, Anatoliy V. Dvurechenskii

Institute of Semiconductor Physics, SB RAN

P2-46

SPIRIT: The European Way – Ion Beams for Everybody

Andreas Kolitsch, Wolfhard Möller, Michael Zier

Forschungszentrum Dresden-Rossendorf

P2-47

Improvement of the oxidation behaviour of complex shaped TiAl-alloys by plasma immersion ion implantation with fluorine

Andreas Kolitsch¹, Rossen Yankov¹, Alexander Donchev²

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2 *DECHEMA Frankfurt*

P2-48

Effects of Aluminum Plasma Immersion Ion Implantation on the Electrical Properties of Cu Films Deposited by Magnetron Sputtering

Quanzhang An^{1,2}, Liuhe Li^{2,3}, Xun Cai¹, Ricky K. Y. Fu², Paul K. Chu²

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2 *City University of Hong Kong*

3 *Beijing University of Aeronautics and Astronautics*

P2-49

Optimization and Characterization of Amorphous Iron Disilicide formed by Ion Irradiation of Fe/Si Multilayer Structures for Photovoltaic Applications

Luke Daniel Antwis, Lewis Wong, Andy Smith, Kevin Homewood, Chris Jeynes, Russell Gwilliam

University of Surrey Ion Beam Centre

P2-50

Fabrication of planar waveguides in chalcogenide glass using proton implantation method

Feng Qiu¹, Tadashi Narusawa¹, Feng Chen²

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2 *Shandong University, China*

P2-51

Magnetic and Optical Properties of Manganese Implanted Gallium Nitride and Their Effects on Silicon Ion Irradiation

Sheshmani K. Dubey¹, N. S. Pradhan¹, A. D. Yadav¹, B. K. Panigrahi², K. G. M. Nair², A. Venugopal³, G. Jangam³

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2 *Materials Science Division, Indira Gandhi Centre for Atomic Research*

3 *Tata Institute of Fundamental Research*

P2-52

Fabrication of Tetragonal and Close-Packed Nano-cell Structures on Compound Semiconductor Surface

Kazuyuki Takahashi¹, Osamu Ishikawa¹, Kazuhiro Yokoyama¹, Masafumi Taniwaki¹, Noriko Nitta²

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P2-53

The iono-luminescence of GaNAsP alloy thin film made by ion beam technology

Chun-Yen Cheng, Huan Niu

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P2-54

Plasma Immersion Ion Implantation applied to N⁺P junction realisation in 4H-SiC

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Effect of Helium implantation and Au diffusion on electrical and structural properties of 4H-SiC epitaxial layers

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Change of Internal Residual Stress in DLC Films under Ion Implantation

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Effect of implantation parameters on damage buildup in ZnO bombarded by heavy ions

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Surface Modification of Silicone Rubber for Adhesion Patterning of Mesenchymal Stem Cells by Water Cluster Ion Beam

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Preferential refilling and planarization of grooves with amorphous carbon by using gas cluster ion beam irradiations

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Surface Processing and Modification of Polymers by Water Cluster Ion Beam

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Evaluation of damage layer in an organic film with irradiation of energetic ion beams

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P2-62High Speed Si Etching with ClF₃ Cluster Injection

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Argon Cluster Beam Modification of Diamond Surfaces

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In-situ X-ray photoelectron spectroscopy analysis of organic materials irradiated with gas cluster ion beams

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Luminescent Si nanostructures formed in silica by swift heavy ions: dependence on Si content

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Physical ion sputtering at glancing incident angles as a novel IC de-processing technique

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X-ray scattering study of the H-implanted dose influence on lattice strain in silicon

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Innovative full coverage monitoring of ion implant induced metallic contamination

Philippe Maillot, Philippe Roux
STMicroelectronics

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Extending Ion Source Life on SEN Ion Implant Tools with In-Situ Chemical Cleaning

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