

SYMPOSIUM K

Silicon Carbide—Materials, Processing, and Devices

December 2 – 4, 2002

Chairs

Stephen E. Sadow Univ of South Florida
Nelson S. Saks Naval Research Laboratory
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Symposium Support
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Proceedings to be published in both
book form and online
(see *ONLINE PUBLICATIONS* at www.mrs.org)
as Volume 742
of the Materials Research Society
Symposium Proceedings Series

* Invited paper

SESSION K1: EPITAXIAL GROWTH
Chairs: David J. Larkin and Tsunenobu Kimoto
Monday Afternoon, December 2, 2002
Room 206 (Hynes)

1:30 PM *K1.1
EPITAXIAL GROWTH AND CHARACTERIZATION OF
4H-SiC(11 $\bar{2}$ 0) AND (0338). Tsunenobu Kimoto, Shun-ichi Nakamura,
Keiko Fujihira, Kouichi Hashimoto, Katsunori Danno, Yuuki Negoro,
and Hiroyuki Matsunami, Department of Electronic Science and
Engineering, Kyoto University, Kyoto, JAPAN.

2:00 PM *K1.2
CHANNEL EPITAXY OF OF 3C-SiC ON Si SUBSTRATES BY
CVD. S. Nishino, Y. Okui, C. Jacob[†] and S. Ohshima, Kyoto
Institute of Technology, Department of Electronics and Information
Science, Kyoto, JAPAN; [†]Materials Science Centre, Indian Institute of
Technology, Kharagpur, INDIA.

2:30 PM K1.3
MODELLING ANALYSIS OF FREE-SPREADING SUBLIMATION
GROWTH OF FACETED SiC CRYSTALS. M.V. Bogdanov, S.E.
Demina, S.Yu. Karpov, A.V. Kulik, D.Kh. Ofengeim, M.S. Ramm,
Soft-Impact Ltd, St. Petersburg, RUSSIA; E.N. Mokhov, A.D.
Roenkov, Yu.A. Vodakov, Crystal Growth Science and Technology
Lab, St. Petersburg, RUSSIA; Yu.N. Makarov, Semiconductor
Technology Research Inc, Richmond, VA; H. Helava, The Fox Group
Inc, Livermore, CA.

2:45 PM K1.4
EXPERIMENT AND MODELING OF THE LARGE AREA
ETCHING AND GROWTH RATE OF EPITAXIAL SiC. J. Meziere,
M. Pons, J-M Dedulle, E. Blanquet, CNRS Grenoble, FRANCE; L. Di
Cioccio, P. Ferret, T. Billon, CEA-Grenoble, FRANCE.

3:00 PM BREAK

3:30 PM *K1.5
RECONSTRUCTION AND EPITAXIAL ADLAYERS ON SiC
SURFACES: STRUCTURAL SIGNIFICANCE FOR
TECHNOLOGICAL APPLICATIONS. Ulrich Starke,
Max-Planck-Institut für Festkörperforschung, Stuttgart, GERMANY.

4:00 PM *K1.6
3C-SiC MONOCRYSTALS GROWN ON UNDULANT Si(001)
SUBSTRATES. Hiroyuki Nagasawa, Kuniaki Yagi, Takamitsu
Kawahara, Naoki Hatta, Hoya Advanced Semiconductor Technologies
Co. Ltd, Tokyo, JAPAN.

4:30 PM K1.7
GROWTH OF COLUMNAR SiC ON PATTERNED Si

SUBSTRATES BY CVD. Shigehiro Nishino, Yoich Okui, Yuehai Tai,
and Chacko Jacob[†], Kyoto Institute of Technology, Department of
Electronics and Information Science, Kyoto, JAPAN. [†]Materials
Science Centre, Indian Institute of Technology, Kharagpur, INDIA.

SESSION K2: POSTER SESSION
Chair: David J. Larkin
Monday Evening, December 2, 2002
8:00 PM
Exhibition Hall D (Hynes)

K2.1
ION DOSE DEPENDENCE ON SOLID PHASE EPITAXY OF
AMORPHOUS SILICON CARBIDE INDUCED BY ION
IMPLANTATION. In-Tae Bae, Dept of Materials Science and
Engineering, Osaka Univ, Osaka, JAPAN; Manabu Ishimaru,
Yoshihiko Hirotsu, The Institute of Scientific and Industrial Research,
Osaka Univ, Osaka, JAPAN.

K2.2
RADIAL DISTRIBUTION FUNCTIONS OF AMORPHOUS
SILICON CARBIDE. Manabu Ishimaru, In-Tae Bae, Yoshihiko
Hirotsu, Osaka Univ, The Institute of Scientific and Industrial
Research, Osaka, JAPAN.

K2.3
MEMORY SWITCHING IN IMPLANTED HYDROGENATED
AMORPHOUS SILICON CARBIDE THIN FILM DEVICES.
R.G. Gateru, J.M. Shannon, S.R.P. Silva, University of Surrey, School
of Electronics, Computing and Mathematics, Guildford, Surrey,
UNITED KINGDOM.

K2.4
THERMAL CHEMICAL VAPOR DEPOSITION OF SILICON
CARBIDE FILMS AS PROTECTIVE COATINGS FOR
MICROFLUIDIC STRUCTURES. Ulrike Futschik, Spyros Gallis,
James Castracane, Alain E. Kaloyeros, and Harry Efstathiadis, School
of NanoSciences and NanoEngineering, The University at
Albany-SUNY, Albany, NY; Leo Macdonald and Susan Hayes, Starfire
Systems Inc, Watervliet, NY; Costas G. Fountzoulas, Army Research
Laboratory, Weapons Material Directorate, Aberdeen Proving
Ground, MD.

K2.5
WAFER BONDING TECHNIQUE APPLIED TO SiC/SiC SYSTEM.
G.N. Yushin, A.V. Kvit, and Z. Sitar, North Carolina State
University, Department of Material Science and Engineering, Raleigh,
NC.

K2.6
STRUCTURAL AND PHOTOELECTRONIC PROPERTIES OF
HYDROGENATED AMORPHOUS SILICON CARBIDE THIN
FILMS PREPARED BY VHF-PECVD. Zhihua Hu, Xianbo Liao,
Xiangbo Zeng, Yanyue Xu, Shibin Zhang, Hongwei Diao, Guangling
Kong, Applied Physics Division, Institute of Semiconductors, Beijing,
CHINA.

K2.7
FIELD ENHANCEMENT MECHANISMS AND ELECTRON FIELD
EMISSION PROPERTIES OF ION BEAM SYNTHESIZED AND
MODIFIED SiC/Si HETEROSTRUCTURES. W.M. Tsang,
S.P. Wong, Chinese Univ of Hong Kong, Dept of Electronic
Engineering and Materials Science and Technology Research Centre,
Hong Kong, CHINA; J.K.N. Lindner, Univ. of Augsburg, Institut für
Physik, Augsburg, GERMANY.

K2.8
TUNING THE SPECTRAL DISTRIBUTION OF p-i-n a-SiC:H
DEVICES FOR COLOUR DETECTION. Paula Louro, Alessandro
Fantoni, Miguel Fernandes, Reinhard Schwarz, Manuela Vieira,
Electronics Telecommunications and Computer Dept, ISEL, Lisbon,
PORTUGAL.

K2.9
SPATIALLY RESOLVED PHOTO-AND THERMALLY
STIMULATED LUMINESCENCE IN SEMI-INSULATING SiC
WAFERS. Yu.M. Suleimanov, S. Lulu, I. Tarasov, S. Ostapenko, S.E.
Sadow, University of South Florida, Tampa, FL; V.D. Heydemann,
M.D. Roth, O. Kordina, M.F. MacMillan, Sterling Semiconductor,
Tampa, FL.

K2.10
EXISTENCE OF AN INTERFACE STATE AT THE STACKING
FAULT IN 4H-SiC AND ITS IMPACT ON ELECTRONIC DEVICES.
M.S. Miao, Sukit Limpijumong, and Walter R.L. Lambrecht,

Department of Physics, Case Western Reserve University, Cleveland, OH.

K2.11

CHARACTERIZATION OF POROUS SiC SUBSTRATES AND THE EPILAYER STRUCTURES GROWN ON THEM. J. Bai, P. Gouma, M. Dudley, Department of Materials Science and Engineering, State University of New York, Stony Brook, NY; M. Mynbaeva, Ioffe Physical-Technical Institute, St. Petersburg, RUSSIA; and S. Saddow, Department of Electrical Engineering, University of South Florida, Tampa, FL.

K2.12

DEVELOPMENT OF ION ENERGY LOSS MEASUREMENTS IN 4H- AND 6H-SiC THANKS TO SiC₀₁ WAFERS OF PERFECT CRYSTAL QUALITY. Roberta Nipoti, Caterina Summante, CNR-IMM Sezione di Bologna, Bologna, ITALY; Fabrice Letertre, SOITEC S.A., Parc Technologique des Fontaines, FRANCE.

K2.13

Abstract Withdrawn

K2.14

SPECTROSCOPIC PROPERTIES OF CUBIC SiC ON Si. Zhe Chuan Feng, Ian Ferguson, Georgia Institute of Technology, School of Electrical & Computer Engineering, Atlanta, GA.

K2.15

EFFECT OF DOPING ON THE INDENTATION HARDNESS OF 4H-SiC. Ming Zhang, Case Western Reserve University, Department of Materials Science and Engineering, Cleveland, OH; H.M. Hobgood, Cree, Inc., Durham, NC; Khevna Shastri, P. Pirouz, Case Western Reserve University, Department of Materials Science and Engineering, Cleveland, OH.

K2.16

WHOLE-WAFER OPTICAL MAPPING OF DEFECTS IN INSULATING SILICON CARBIDE WAFERS. M. Mier^a, J. Boeckl^d, D. Hill^b, S. Bertrand^c, E. Ramakrishnan^c, M. Roth^d, C. Balkas^c, and M. Nelson^c; ^aAir Force Research Laboratory, Wright-Patterson AFB OH; ^bWylie Laboratory, Dayton, OH; ^cOriginLab Inc., Northampton MA; ^dSterling Semiconductor Inc., Sterling VA; ^eChemIcon Inc., Pittsburgh, PA.

K2.17

Abstract Withdrawn

K2.18

THERMAL STRESS AS THE MAJOR FACTOR IN SiC DEFECT GENERATION DURING PVT GROWTH. D.I. Cherednichenko, R.V. Drachev, I.I. Khlebnikov and T.S. Sudarshan, Univ. of South Carolina, Dept. of Electrical Engineering, Columbia, SC.

K2.19

THERMAL PLASMA PHYSICAL VAPOR DEPOSITION OF NANOSTRUCTURED SiC COATINGS. Xinhua Wang, Keisuke Eguchi, Toyonobu Yoshida, Univ of Tokyo, Dept of Materials Engineering, Tokyo, JAPAN.

K2.20

STRANSKI-KRASTANOV GROWTH OF Ge QUANTUM DOTS ON SiC SUBSTRATES. C. Calmes, V. LeThanh, D. Bouchier, V. Yam, D. Débarre, R. Laval, Institut d'Electronique Fondamentale, Université Paris-Sud, Orsay, FRANCE; S.E. Saddow, Center for Microelectronics Research, University of South Florida, Tampa, FL.

K2.21

FIRST-PRINCIPLES STUDY OF SiC/M (M=Ti AND Al) NANO-HETERO POLAR INTERFACES. Shingo Tanaka (Swing), Masanori Kohyama, National Institute of Advanced Industrial Science and Technology (AIST), Special Division of Green Life Tech., Osaka, JAPAN.

K2.22

BAND GAP ENGINEERING OF SiCN FILM GROWN BY PULSED LASER DEPOSITION. Nae-Man Park, Sang Hyeob Kim, Gun Yong Sung, Electronics and Telecommunications Research Institute, Basic Research Lab, Daejeon, KOREA.

SESSION K3: CHARACTERIZATION/DEFECTS

Chairs: Adolf Schöner and Michael Dudley
Tuesday Morning, December 3, 2002
Room 206 (Hynes)

8:30 AM *K3.1

SOME CURRENT EFFORTS AT CHARACTERIZATION OF SILICON CARBIDE. W.J. Choyke, R.P. Devaty, University of Pittsburgh, Department of Physics and Astronomy, Pittsburgh, PA; and Collaborators.

9:00 AM *K3.2

RECENT RESULTS ON DEFECT CENTERS IN SiC POLYTYPES. Gerhard Pensl, University of Erlangen-Nuernberg, Institute of Applied Physics, Erlangen, GERMANY.

9:30 AM K3.3

ION IMPLANTATION INDUCED DEEP DEFECTS IN N-TYPE 4H-SILICON CARBIDE. A.O. Evwaraye, University of Dayton, Physics Dept., Dayton, OH; S.R. Smith, University of Dayton Research Institute, Dayton, OH; M.A. Capano, Purdue University, Dept. of ECE, West Lafayette, IN.

9:45 AM K3.4

EFFECTS OF STRUCTURAL DEFECTS ON DIODE PROPERTIES IN 4H-SiC. B.J. Skromme, K. Palle, Dept of Electrical Engineering and Center for Solid State Electronics Research, Arizona State University, Tempe, AZ; H. Meidia, S. Mahajan, Dept of Chemical and Materials Engineering and Center for Solid State Electronics Research, Arizona State University, Tempe, AZ; W.M. Vetter, M. Dudley, Dept of Materials Science and Engineering, State Univ of New York at Stony Brook, Stony Brook, NY; K. Moore, S. Smith, T. Gehoski, Physical Sciences Research Lab., Motorola, Inc., Tempe, AZ.

10:00 AM BREAK

10:30 AM *K3.5

PROCESS INDUCED EXTENDED DEFECTS IN SILICON CARBIDE CRYSTALS GROWN VIA SUBLIMATION. Rositza Yakimova, Linköping University, Dept of Physics and Measurement Technology, Linköping, SWEDEN.

11:00 AM K3.6

DEPENDENCE OF STACKING FAULT GROWTH DYNAMICS ON CURRENT THROUGH SiC PIN DIODES. R.E. Stahlbush, M.G. Ancona, Naval Research Laboratory, Washington, DC; J.B. Fedison, J.E. Tucker, S.D. Arthur, GE Global Research Center, Niskayuna, NY.

11:15 AM K3.7

EXTENDED DEFECTS IN 4H SiC PIN DIODES. M.E. Twigg, R.E. Stahlbush, M. Paterni, Naval Research Laboratory, Electronics Science and Technology Division, Washington, DC; S.B. Aathur, J.B. Fedison, J.E. Tucker, General Electric, Niskayuna, NY; S. Wang, Sterling Semiconductor, Danbury, CT.

11:30 AM K3.8

ACCURATE LATTICE CONSTANT AND MISMATCH MEASUREMENTS OF SiC HETEROSTRUCTURES USING HARMONIC X-RAY REFLECTIONS. Michael Dudley, XianRong Huang, SUNY at Stony Brook, Dept of Materials Science and Engineering, Stony Brook, NY; Philip G. Neudeck, J. Anthony Powell, NASA Glenn Research Center, Cleveland, OH.

11:45 AM K3.9

INFLUENCE OF ERBIUM DOPING ON THE FORMATION OF SILICON CARBIDE NANOCRYSTALS FOR OPTOELECTRONIC APPLICATIONS. Spyros Gallis, Ulrike Futschik, Iftikhar Ul-Hasan, Mengbing Huang, Alain E. Kaloyeros, and Harry Efstathiadis, School of NanoSciences and NanoEngineering, University at Albany-SUNY, Albany, NY.

SESSION K4: MOS TECHNOLOGY

Chairs: Marek Skowronski and Nelson S. Saks
Tuesday Afternoon, December 3, 2002
Room 206 (Hynes)

1:30 PM *K4.1

THE 4H-SiC/SiO₂ INTERFACE. J.K. McDonald^{a,†}, R.A. Weller^{b,a} and L.C. Feldman^a; ^aDept. of Physics and Astronomy, ^bDept. of Elec. Eng. & Comp. Sci., Vanderbilt Univ., Nashville, TN; G. Chung[†], C.C. Tin and J.R. Williams, Physics Dept., Auburn Univ, Auburn, AL. Current address: [†]Sandia National Laboratories, Albuquerque, NM; [‡]Sterling Semiconductor Inc., Tampa, FL.

2:00 PM *K4.2

NANOSCALE CHARACTERIZATION OF THE SILICON DIOXIDE/SILICON CARBIDE INTERFACE AND THE EFFECT OF PROCESSING CONDITIONS. Kai-Chieh Chang, Carnegie Mellon University, Dept of Materials Science and Engineering, Pittsburgh,

PA; Jim Bentley, Oak Ridge National Lab, Metals & Ceramics Div, Oak Ridge, TN; [Lisa M. Porter](#), Carnegie Mellon University, Dept of Materials Science and Engineering, Pittsburgh, PA.

2:30 PM K4.3

ATOMIC SCALE OXIDATION OF SiC SURFACES. [Fabrice Amy](#), Yves J. Chabal, Agere Systems, Murray Hill, NJ; [Patrick Soukiassian](#), Commissariat l'Energie Atomique, DSM-DRECAM-SPCSI-SIMA, Saclay, FRANCE.

2:45 PM K4.4

PHASE DIAGRAM FOR THE INTERACTION OF OXYGEN WITH SiC. Y. Song, Dept. of Physics, Vanderbilt U., Nashville, TN; and [F.W. Smith](#), Dept. of Physics, City College of New York, NY.

3:00 PM BREAK

3:30 PM *K4.5

SiO₂/SiC INTERFACE PROPERTIES ON VARIOUS SURFACE ORIENTATIONS. [Hiroshi Yano](#), Tomoaki Hatayama, Yukiharu Uraoka, and Takashi Fuyuki, Nara Institute of Science and Technology, Graduate School of Materials Science, Nara, JAPAN; Tsunenobu Kimoto and Hiroyuki Matsunami, Kyoto University, Department of Electronic Science and Engineering, Kyoto, JAPAN.

4:00 PM K4.6

OXIDATION KINETICS OF THE (11 $\bar{2}$ 0) CRYSTAL FACE OF 4H-SiC. [S. Dhar](#), Y.W. Song, A.B. Hmelo, L.C. Feldman, Vanderbilt Univ, Interdisciplinary Program in Materials Science, Dept. of Physics and Astronomy, Nashville, TN; R. Kalish, Technion, Physics Department and Solid State Institute, Haifa, ISRAEL.

4:15 PM K4.7

AFTERGLOW THERMAL OXIDATION OF SILICON CARBIDE. [Andrew M. Hoff](#), Arti Tibrewala, and Stephen E. Sadow, Department of Electrical Engineering, University of South Florida, Tampa, FL.

4:30 PM K4.8

A SEMI-EMPIRICAL MODEL FOR ELECTRON MOBILITY AT THE SiC/SiO₂ INTERFACE. [Nelson Saks](#), Naval Research Laboratory, Washington, DC.

SESSION K5: POSTER SESSION

Chair: Stephen E. Sadow

Tuesday Evening, December 3, 2002

8:00 PM

Exhibition Hall D (Hynes)

K5.1

INFLUENCE OF CONDITIONS OF GROWTH ON STRUCTURAL AND ELECTRICAL PROPERTIES OF SEMICONDUCTOR SOLID SOLUTIONS (SiC)_{1-x}(AlN)_x AT SUBLIMATIONS EPITAXY. [Gadgimet Safaraliev](#), [Malik Kurbanov](#), Bilal Bilalov, Gulja Kardashova, Marat Gusejnov, Dagestan State University, Makhachkala, Dagestan, RUSSIA.

K5.2

CONFINEMENT OF SCREW DISLOCATIONS TO PREDETERMINED LATERAL POSITIONS IN (0001) 4H-SiC EPILAYERS USING HOMOEPITAXIAL WEB GROWTH. [Philip G. Neudeck](#), J. Anthony Powell, Glenn M. Beheim, and Emye L. Benevise, NASA Glenn Research Center, Cleveland, OH; [Andrew J. Trunek](#) and [David J. Spry](#), OAI, Cleveland, OH.

K5.3

MODELING THE CRYSTAL GROWTH OF CUBIC SILICON CARBIDE BY MOLECULAR DYNAMICS SIMULATIONS. [Nicoletta Resta](#), Christopher Kohler, and Hans-Rainer Trebin, Institut für Theoretische und Angewandte Physik, Universität Stuttgart, GERMANY.

K5.4

POLYTYPE TRANSFORMATION DURING SiC CRYSTAL GROWTH. S.I. Maximenko, I.I. Khlebnikov and [T.S. Sudarshan](#), University of South Carolina, Columbia, SC.

K5.5

CHARACTERIZATION OF A CERAMIC-METAL-CERAMIC BOND: CHEMICAL VAPOR DEPOSITED (CVD) SILICON CARBIDE JOINED BY A SILVER-BASED ACTIVE BRAZING ALLOY (ABA). [James V. Marzik](#), Morgan Advanced Ceramics, Inc, Hudson, NH; [Toshi Oyama](#), Morgan Advanced Ceramics, Inc, Hayward, CA; [Warren J. Moberly](#), [Chan, William J. Croft](#), Harvard University, Cambridge, MA.

K5.6

HOMOEPITAXIAL 4H-SiC FILMS GROWN BY MICROWAVE PLASMA CHEMICAL VAPOR DEPOSITION. [Mitsuo Okamoto](#)^{a,b}, [Ryoji Kosugi](#)^{a,b}, [Shinichi Nakashima](#)^{a,b,c}, [Kenji Fukuda](#)^{a,b} and [Kazuo Arai](#)^{a,b}; ^aNational Institute of Advanced Industrial Science and Technology, Ibaraki, JAPAN; ^bUltra-Low-Loss Power Device Technology Research Body, Ibaraki, JAPAN; ^cR&D Association for Future Electron Devices, Advanced Power Device laboratory, Tokyo, JAPAN.

K5.7

STEP-STEP INTERACTION ON VICINAL 4H AND 6H-SiC SURFACES. [Hiroshi Nakagawa](#), [Satoru Tanaka](#), and [Ikuo Suemune](#), Research Institute for Electronic Science, Hokkaido Univ., Sapporo, JAPAN.

K5.8

NANOSCALE POLISHING OF SILICON CARBIDE AND SILICON WITH GAS-CLUSTER ION BEAMS. [Vincent DiFilippo](#), Tufts Univ, Dept of Mechanical Engineering, Medford, MA; [David Fenner](#), Epion Corp, Billerica, MA; [Leonard Feldman](#), Vanderbilt Univ, Dept of Physics and Astronomy, Nashville, TN; [James Hirvonen](#), Army Research Lab, Aberdeen Proving Ground, MD; [Anil Saigal](#), Tufts Univ., Medford, MA.

K5.9

STRUCTURAL AND ELECTRICAL PROPERTIES OF 200ns-PULSE EXCIMER LASER ANNEALED Al⁺ ION IMPLANTED 4H-SiC. [C. Dutto](#)^{a,b}, [E. Fogarassy](#)^b, [D. Mathiot](#)^b, [D. Muller](#)^b, [P. Kern](#)^b, [S. Joulie](#)^c, [J. Werckmann](#)^c; ^aSTMicroelectronics, Tours, FRANCE; ^bLaboratoire PHASE-CNRS (UPR 292), Strasbourg, FRANCE; ^cLaboratoire IPCMS (GSI), CNRS, Strasbourg, FRANCE.

K5.10

CRYSTALLINE EVALUATION BY ANNEALING TREATMENT OF 4H-SiC. [Shin-ichiro Uekusa](#), [Hiroshi Maruyama](#), [Takayuki Goto](#), Department of Electrical and Electronic Engineering, Meiji University, Kanagawa, JAPAN.

K5.11

EPR STUDY OF THE CHANGES CAUSED BY HIGH TEMPERATURE ANNEALING OF 4H SiC. [V.V. Kononov](#), [D. Alvarez](#), and [M.E. Zvanut](#), University of Alabama at Birmingham, Dept of Physics, Birmingham, AL.

K5.12

TRANSPORT MECHANISMS IN FOCUSED ION BEAM ASSISTED OHMIC CONTACTS TO P-TYPE 6H-SiC. [Agis A. Iliadis](#), [Luohong Liu](#), Univ of Maryland, Dept of Electrical and Computer Eng, College Park, MD; [K.A. Jones](#), Army Research Lab, Adelphi, MD.

K5.13

STABLE OHMIC CONTACT FOR P-TYPE 6H-SiC USING Ti/Al AND TiN/Al THIN FILMS. [Byung-Teak Lee](#), [Jong-Yoon Shin](#), Chonnam Natl Univ, Dept of Materials Science and Engineering, Gwangju, KOREA; [Sang-Yoon Han](#), [Jong-Lam Lee](#), Pohang Univ of Science and Technology (POSTECH), Dept of Materials Science and Engineering, Pohang, KOREA.

K5.14

LOW TEMPERATURE FORMATION OF Ni SILICIDE CONTACTS TO SiC. [Chris Deeb](#) and [Arthur H. Heuer](#), Case Western Reserve University, Cleveland, OH.

K5.15

PHOTOCHEMICAL PATTERN ETCHING OF SILICON-CARBIDE BY USING EXCIMER LASER AND HYDROGEN PEROXIDE SOLUTION. [Dai Sasaki](#), [Masataka Murahara](#), Tokai Univ, Department of Electrical Engineering, Hiratsuka, Kanagawa, JAPAN.

K5.16

THE EFFECT OF ANNEALING ON HIGH-RESISTIVITY AND SEMI-INSULATING 4H-SiC. [S.R. Smith](#), University of Dayton Research Institute, A.O. Ewvaraye, University of Dayton Physics Department; [W.C. Mitchel](#), Air Force Research Laboratory, Manufacturing and Materials Directorate.

K5.17

DEFECT ACCUMULATION AND RECOVERY IN ALUMINUM IMPLANTED 4H- AND 6H-SiC. [W. Jiang](#), [W.J. Weber](#), Pacific Northwest National Laboratory, Richland, WA; [Y. Zhang](#), [Ånström](#) Laboratory, Uppsala University, Uppsala, SWEDEN.

K5.18

DAMAGE RECOVERY OF Al IMPLANTED 6H-SiC BY NOVEL "CAP AND ANNEAL" PROCESS. [V.N. Kulkarni](#), [S.S. Hullavarad](#),

R.D. Vispute, J.A. McGee, S.R. Harmon, D.J. Wagstaffe, and T. Venkatesan, CSR, Department of Physics, University of Maryland, College Park, MD; K.A. Jones and M.H. Ervin, Army Research Laboratory, Adelphi, MD.

K5.19

THE EFFECT OF CHANNEL RECESS AND PASSIVATION ON 4H-SiC MESFETS. Ho-Young Cha, Christopher I. Thomas, Goutam Koley, Lester F. Eastman, Michael G. Spencer, Cornell University, Dept of Electrical and Computer Engineering, Ithaca, NY.

K5.20

HAZARDOUS GAS DETECTION USING SILICON CARBIDE SENSORS. C.I. Muntele, D. Ila, I.C. Muntele, R.L. Zimmerman, Alabama A&M University, Center for Irradiation of Materials, Normal, AL.

K5.21

FABRICATION OF NOVEL OPTICAL HIGH-TEMPERATURE SENSOR USING SiC THIN FILM GROWN ON SAPPHIRE SUBSTRATE. Lin Cheng, Andrew J. Steckl, Nanoelectronics Laboratory, University of Cincinnati, Cincinnati, OH; James D. Scofield, Air Force Research Laboratory, Wright-Patterson Air Force Base, OH.

K5.22

Abstract Withdrawn

K5.23

DUAL-METAL-PLANAR RECTIFIERS ON SILICON CARBIDE USING Ti AND Ni₂Si AS SCHOTTKY BARRIER METALS. Fabrizio Roccaforte, Francesco La Via, Salvatore Di Franco, Vito Raineri, CNR-IMM, sezione di Catania, Catania, ITALY.

K5.24

3C-SiC/6H-SiC HETEROJUNCTION DIODES. A.A. Lebedev, A.M. Strel'chuk, N.S. Savkina, E.V. Bogdanova, A.S. Tregubova, A.N. Kuznetsov, A.F. Ioffe Physico-Technical Institute, Laboratory Physics of Semiconductor Devices, St. Petersburg, RUSSIA.

K5.25

IMPLICATIONS OF GROWTH INDUCED DEFECTS ON THE ELECTRICAL AND MECHANICAL PROPERTIES OF AIN THIN FILMS ON SiC. Daniel Habersat, R.D. Vispute, S.S. Hullavarad, N. Reeves, B. Nagaraj, V.N. Kulkarni and T. Venkatesan, CSR, Department of Physics, University of Maryland, College Park, MD; C.J. Scozzie, Matt Ervin, and A. Lelis Army Research Laboratory, Adelphi, MD.

K5.26

MECHANISTIC ASPECTS OF SiC OXIDATION. Fernanda Chiarello Stedile, Instituto de Química, UFRGS, Porto Alegre, BRAZIL; Cláudio Radtke, Israel Jacob Rabin Baumvol, Instituto de Física, UFRGS, Porto Alegre, BRAZIL; Ian Cameron Vickridge, Isabelle Trimaille, Jean-Jacques Ganem, Serge Rigo, Groupe de Physique des Solides, Université Paris, FRANCE.

K5.27

OPTIMIZATION OF DIRECT N₂O GROWN GATE OXIDE ON 4H-SiC. K.Y. Cheong, and S. Dimitrijević, School of Microelectronic Engineering, Griffith University, Nathan Campus, Queensland, AUSTRALIA.

K5.28

MONITORING ION IMPLANTATION OF SiC AND THE RECOVERY OF DAMAGE BY MICRO-RAMAN AND MICRO-PHOTOLUMINESCENCE SPECTROSCOPY. J.W. Steeds, S. Furkert, Department of Physics, University of Bristol, Bristol, UNITED KINGDOM.

SESSION K6: SiC PROCESSING

Chairs: Stephen E. Saddow and Lisa M. Porter
Wednesday Morning, December 4, 2002
Room 206 (Hynes)

8:30 AM *K6.1

ALUMINUM AND BORON DIFFUSION IN 4H-SiC. Margareta Linnarsson, Martin Janson, Bengt Svensson, Royal Institute of Technology, Solid State Electronics, Stockholm, SWEDEN; Adolf Schöner, ACREO AB, Stockholm, SWEDEN.

9:00 AM K6.2

ELECTRICAL CHARACTERIZATION OF Al/Ti OHMIC CONTACTS ON P-TYPE ION IMPLANTED 4H AND 6H-SiC. Francesco Moscatelli, Andrea Scorzoni, Università di Perugia,

Dipartimento d'Ingegneria Elettronica e dell'Informazione, Perugia, ITALY; Antonella Poggi, Gian Carlo Cardinali, Roberta Nipoti, CNR-IMM Sezione di Bologna, ITALY; Mihai Lazar, Dominique Planson, Christophe Raynaud, Jean-Pierre Chante, Marie-Laure Locatelli, CEGELY (UMR CNRS n°5005), INSA de Lyon, Villeurbanne Cdx, FRANCE.

9:15 AM K6.3

OHMIC CONTACT PROPERTIES OF Ni/C FILMS ON 4H-SiC. Weijie Lu, Department of Physics, Fisk University, Nashville, TN; W.C. Mitchel, Air Force Research Laboratory, Materials and Manufacturing Directorate, Wright-Patterson Air Force Base, OH; J.R. Landis, University of Dayton Research Institute, Dayton, OH; T.R. Crenshaw, and W. Eugene Collins, Department of Physics, Fisk University, Nashville, TN.

9:30 AM K6.4

CONTROL OF MESA SIDEWALL ANGLE DURING THE INDUCTIVITY COUPLED PLASMA-REACTIVE ION ETCHING OF SiC SINGLE CRYSTALS. S.C. Ahn, B.T. Lee, Photonic and Electronic Thin Film Laboratory, Department of Materials Science and Engineering, Chonnam National University, Gwang-ju, KOREA.

9:45 AM BREAK

10:15 AM *K6.5

OPTICALLY ENHANCED INTERACTION OF HYDROGEN WITH DEFECTS IN SiC. Yaroslav Koshka, Dept of Electrical and Computer Engineering, Mississippi State University, Mississippi State, MS.

10:45 AM *K6.6

POROUS SILICON CARBIDE: PROSPECTIVE APPLICATIONS. Marina Mynbaeva, Ioffe Physico-Technical Institute, St. Petersburg, RUSSIA.

11:15 AM K6.7

PSEUDOMORPHICALLY STRAINED LAYERS IN 4H SiC FORMED BY GERMANIUM IMPLANTATION. M.W. Dashiell, Xin Zhang, G. Xuan, and J. Kolodzey, Department of Electrical and Computer Engineering, University of Delaware, Newark, DE.

11:30 AM K6.8

BAND LINE-UP OF 4H-SiC SCHOTTKY INTERFACES MEASURED WITH PHOTOEMISSION SPECTROSCOPY. M. Beerbom, J. Kohlscheen, S.E. Saddow, J.T. Wolan, University of South Florida; G. Chung, M.F. MacMillan, Sterling Semiconductor, Inc.; and R. Schlaf, University of South Florida.

SESSION K7: DEVICES

Chairs: Gerhard Pensl and Roland Rupp
Wednesday Afternoon, December 4, 2002
Room 206 (Hynes)

1:30 PM *K7.1

SYSTEM DESIGN CONSIDERATIONS FOR OPTIMIZING THE BENEFIT BY UNIPOLAR SiC POWER DEVICES. Roland Rupp, Ilya Zverev, Infineon Technologies AG, Dep. AI PS, Erlangen, GERMANY.

2:00 PM *K7.2

PiN RECTIFIERS AND BIPOLAR SWITCHES IN 4H-SiC. Ranbir Singh, D.C. Capell, J.J. Sumakeris, and St. G. Müller, Cree Inc., Durham, NC.

2:30 PM K7.3

SiC BIPOLAR JUNCTION TRANSISTORS FOR HIGH POWER SWITCHING AND RF APPLICATIONS. Anant Agarwal, Sei-Hyung Ryu, John Palmour, Cree Inc., Durham, NC; Binh Phan, Howard Bartlow, Jerry Stambaugh, Ken Brewer, Cree Microwave, Sunnyvale, CA.

2:45 PM K7.4

ELECTRICAL INSTABILITY SUPPRESSION IN 4H-SiC POWER MESFETS. J.B. Tucker^a, R.A. Beaupre^a, A.P. Zhang^a, J.L. Garrett^a, A. Vertiatichikh^c, L.B. Rowland^a, E. B. Kaminsky^a, J.W. Kretchmer^a, J. Foppes^b, A.F. Allen^b, L.F. Eastman^c; ^aGeneral Electric, Global Research Center, Niskayuna, NY; ^bLM NE&SS-Radar Systems, Syracuse, NY; ^cCornell University, Ithaca, NY.

3:00 PM BREAK

3:15 PM *K7.5

INFLUENCE OF INTERFACE STATES ON HIGH TEMPERATURE SILICON CARBIDE ELECTRONICS AND

SENSORS. Ruby N. Ghosh, Peter Tobias, Sally G. Ejakov and Brage Golding, Center for Sensor Materials, Michigan State University, East Lansing, MI.

3:45 PM *K7.6

TOWARDS FERROELECTRIC FIELD EFFECT TRANSISTORS IN 4H-SILICON CARBIDE. S.-M. Koo, S.I. Khartsev, C.-M. Zetterling, A.M. Grishin, and M. Ostling, Department of Microelectronics and Information Technology, Royal Institute of Technology (KTH), Stockholm-Kista, SWEDEN.

4:15 PM K7.7

7 kV 4H-SiC GTO THYRISTORS. Stephen Van Campen, John Zingaro, Andris Ezis, Garrett Storaska, Kevin Elliott, R. Chris Clarke, Northrop Grumman, Advanced Materials and Semiconductor Device Technology Center, Baltimore, MD; Vic Temple, Todd Hansen, Silicon Power Corporation, Malvern, PA.

4:30 PM K7.8

FABRICATION AND CHARACTERIZATION OF 4H-SILICON CARBIDE AVALANCHE PHOTODIODES. Kent Burr, Peter Sandvik, Stephen Arthur, Dale Brown, Kevin Matocha, GE Global Research Center, Niskayuna, NY.

4:45 PM K7.9

A NEW PROCESS FOR THE FABRICATION OF SCHOTTKY DIODES AND MESFETS ON SiCOI (SILICON CARBIDE ON INSULATOR) SUBSTRATES. Francois Templier, CEA-LETI, Grenoble, FRANCE; Nicolas Daval, SOITEC, Bernin, FRANCE and CEGELY-INSA, Villeurbanne, FRANCE; Fabrice Letertre, SOITEC, Bernin, FRANCE; Daniel Bourgeat, CEA-LETI, Grenoble, FRANCE; Dominique Planson and Jean-Pierre Chante, CEGELY-INSA, Villeurbanne, FRANCE; Thierry Billon, CEA-LETI, Grenoble, FRANCE.