

2013 International Conference on Indium Phosphide and Related Materials

(IPRM 2013)

**Kobe, Japan
19 – 23 May 2013**



**IEEE Catalog Number: CFP13IIP-PRT
ISBN: 978-1-4673-6130-9**

Table of Contents

Monday, May 20, 2013

MoPLN

Plenary Session

MoPLN-3 (plenary) 10:30 - 11:10

Advances in III-V Semiconductor Photonics: Nanostructures and Integrated Chips 0008

*Osamu Wada

Kobe University, Japan

MoPLN-4 (plenary) 11:10 - 11:50

III-V MOS Technology: From Planar to 3D and 4D 0005

*Peide D Ye

Purdue University, United States of America

MoC3

Optical Properties of Nanostructures

MoC3-1 (invited) 14:00 - 14:30

Reshaping the optical properties of quantum dots via strain and electric fields 0007

*Armando Rastelli(*1,*2), Rinaldo Trotta(*1,*2), Eugenio Zallo(*2), Paola Atkinson(*2), and Oliver G. Schmidt(*2)

*(*1)Institute of Semiconductor and Solid State Physics, Johannes Kepler University of Linz, Austria and (*2)Institute for Integrative Nanosciences, IFW Dresden, Germany*

MoC3-2 14:30 - 14:45

Suppression of multi-photon emission in 1.5- μm 0009

*Toshiyuki Miyazawa(*1), Kazuya Takemoto(*2), Yoshiki Sakuma(*3), Haizhi Song(*2), Motomu Takatsu(*2), Tsuyoshi Yamamoto(*1), and Yasuhiko Arakawa(*2,*4)

*(*1)Fujitsu Laboratories Ltd., Japan, (*2)Institute for Nano Quantum Information Electronics, The University of Tokyo, Japan, (*3)National Institute for Materials Science, Japan, and (*4)Institute of Industrial Science, The University of Tokyo, Japan*

MoC3-3 (invited) 14:45 - 15:15

Wurtzite Gallium Phosphide has a Direct Band Gap 0000

Simone Assali, Ilaria Zardo, Sebastien Plissard, Marcel Verheijen, Jos Haverkort, and *Erik Bakkers
TU Eindhoven, Netherlands

MoC3-4 15:15 - 15:30

Self-aligned quantum-dot growth for single-photon sources 0003

U. W. Pohl, *A. Strittmatter, J. H. Schulze, D. Quandt, T. D. Germann, W. Unrau, T. Heindl, O. Hitzemann, D. Bimberg, and S. Reitzenstein
Institut für Festkörperphysik, Technische Universität Berlin, Germany

MoC3-5 15:30 - 15:45

Single-photon emission in telecommunication band from an InAs quantum dot in a pillar structure 0005

*Xiangming Liu(*1), Natsuko Kobayashi(*1), Kouichi Akahane(*2), Masahide Sasaki(*2), Hidekazu Kumano(*1), and Ikuo Suemune(*1)
*(*1)Research Institute for Electronic Science, Hokkaido University, Japan and (*2)National Institute of Information and Communications Technology, Japan*

MoD3

Modulators and Detectors

MoD3-1 (invited) 14:00 - 14:30

Travelling Wave Mach-Zehnder Modulators 0007

*Kelvin Prosyk(*1), Abderrahmane Ait-Ouali(*1), Junfu Chen(*1), Michael Hamacher(*2), Detlef Hoffmann(*2), Ronald Kaiser(*2), Ron Millett(*1), Alessio Piratsu(*1), Marco Totolo(*1), Karl-Otto Velthaus(*2), and Ian Woods(*1)
*(*1)Cogo Optronics, Canada and (*2)Heinrich Hertz Institute, Germany*

MoD3-2 14:30 - 14:45

Novel planar structure single-RF drive MZ optical modulator on InP(110) substrate 0009

*Yoshihiro Ogiso, Masakazu Arai, Eiichi Yamada, Hiromasa Tanobe, Yasuo Shibata, and Masaki Kohtoku
NTT Photonics Laboratories, NTT corporation, Japan

MoD3-3 14:45 - 15:00

Flat-top Optical Frequency Comb Block Generation using InP-based Mach-Zehnder Modulator 0008;

Takeaki Saikai(*1), Takahiro Yamamoto(*1), Eiichi Yamada(*2), and *Hiroshi Yasaka(*1)
(*1)RIEC, Tohoku University, Japan and (*2)NTT Photonic Laboratories, Japan

MoD3-4 15:00 - 15:15

A 1×4 MMI-Integrated High-Power Waveguide Photodetector 00043

*Efthymios Rouvalis, Philipp Müller, Dirk Trommer, Jens Stephan, Andreas G Steffan, and Günter Unterbörsch
u2t Photonics AG, Germany

MoD3-5 15:15 - 15:30

Study of lowering onset gain for a high-speed InGaAs/InAlAs avalanche photodiode 00045

*Masahiro Nada, Yoshifumi Muramoto, Haruki Yokoyama, Tadao Ishibashi, and Hideaki Matsuzaki
NTT Photonics Laboratories, NTT Corporation, Japan

MoD3-6 15:30 - 15:45

Monolithic Integration of InP-Based Waveguide Photodiodes with MIM Capacitors for Compact Coherent Receiver 00047

*Ryuji Masuyama, Hideki Yagi, Naoko Inoue, Yutaka Onishi, Tomokazu Katsuyama, Takehiko Kikuchi, Yoshihiro Yoneda, and Hajime Shoji
Sumitomo Electric Industries, LTD., Japan

MoD3-7 15:45 - 16:00

Monolithic InP Receiver Chip with a 90° Hybrid and a Variable Optical Attenuator for 100Gbit/s Colourless WDM Detection 00049

*Patrick Runge(*1), Stefan Schubert(*1), Angela Seeger(*1), Tom Gärtner(*1), Klemens Janiak(*1), Jens Stephan(*2), Dirk Trommer(*2), and Mads Lønstrup Nielsen(*2)
(*1)Fraunhofer Heinrich-Hertz-Institute, Germany and (*2)u²t Photonics AG, Germany

MoC4

Nano Devices

MoC4-1 (invited) 16:30 - 17:00

Highly non-linear phenomena and coherent effects in 1500 nm QD lasers and amplifiers 0004;

*Gadi Eisenstein(*1), Amir Capua(*1), Ouri Karni(*1), and Johann Peter Reithmaier(*2)

(*1)Technion, Israel and (*2)Kassel University, Germany

MoD4

Advanced Epitaxial Growth

MoD4-1 (invited) 16:30 - 17:00

Selective area MOVPE of InGaAsP and InGaN systems as process analytical and design tools for OEICs 00053

*Yukihiro Shimogaki(*1), Masakazu Sugiyama(*2), and Yoshiaki Nakano(*3)

(*1)Department of Materials Engineering, The University of Tokyo, Japan, (*2)Institute of Engineering Innovation, The University of Tokyo, Japan, and (*3)Research Center for Advanced Science and Technology, The University of Tokyo, Japan

MoD4-2 17:00 - 17:15

MOVPE growth of InAs/InP QDs on directly-bonded InP/Si substrate 00055

Keiichi Matsumoto, *Xinxin Zhang, Yoshinori Kanaya, and Kazuhiko Shimomura

Department of Engineering and Applied Sciences, Sophia University, Japan

MoD4-3 17:15 - 17:30

From surface dimer orientations to bonds at the GaP/Si(100) heterointerface 00057

*Oliver Supplie(*1,*2), Sebastian Brückner(*1,*3), Henning Döscher(*1,*3), Peter

Kleinschmidt(*1,*3,*4), and Thomas Hannappel(*1,*3,*4)

(*1)Helmholtz-Zentrum Berlin, Institute Solar Fuels, Germany, (*2)Humboldt-Universität zu Berlin, Institut für Physik, Germany, (*3)Technische Universität Ilmenau, Institut für Physik, Germany, and (*4)CiS Forschungsinstitut für Mikrosensorik und Photovoltaik, Germany

MoD4-4 17:30 - 17:45

in-situ Characterization of MOCVD grown GaAs- and InP-based tunable VSEL structures 00059

Christian Grasse(*2), *Yuto Tomita(*1), Peter Wiecha(*2), Ralf Meyer(*2), Tobias Gruendl(*2), Michael Mueller(*2), and Markus Christian Amann(*2)

(*1)LayTec AG, Germany and (*2)Walter Schottky Institut, Technical University of Munich, Germany

MoD4-5 17:45 - 18:00

Preparation of single-domain Si(100) surfaces with in situ control in CVD ambient 0005;

Sebastian Brückner(*1,*2), *Oliver Supplie(*1,*3), Peter Kleinschmidt(*1,*2,*4), Anja Dobrich(*1), Henning Döscher(*1,*2), and Thomas Hannappel(*1,*2,*4)

(*1)Helmholtz-Zentrum Berlin, Institute Solar Fuels, Germany, (*2)Technische Universität Ilmenau, Institut für Physik, Germany, (*3)Humboldt-Universität zu Berlin, Institut für Physik, Germany, and (*4)CiS Forschungsinstitut für Mikrosensorik und Photovoltaik, Germany

MoPI

Poster Session

MoPI-1

Zn Diffusion in Ruthenium Doped InP with Annealing by Metalorganic Vapor Phase

Epitaxy 00063

*Harunaka Yamaguchi, Takashi Nagira, Zempei Kawazu, Kenichi Ono, and Masayoshi Takemi
High Frequency & Optical Device Works, Mitsubishi Electric Corporation, Japan

MoPI-2

The Measurement of EPD on InP Single Crystal Wafers 00065

*Qingfang Huang(*1), Zhiguo Liu(*2), Ruixia Yang(*2), Xiaolan Li(*1), Qiang Wang(*1), Xiuwei Tian(*1), Jianye Yang(*1), Shuai Li(*1), Yanlei Shi(*1), Huimin Shao(*1), Xin Zhang(*1), Ning Li(*1), Yong Kang(*1), Huisheng Liu(*1), Tongnian Sun(*1), and Niefeng Sun(*1)

(*1)Science and technology on ASIC Laboratory, Hebei Semiconductor Research Institute, China and (*2)School of Information Engineering, Hebei University of Technology, China

MoPI-3

Optimizing of metamorphic buffer layer for extended-InGaAs/InP photodetectors 00067

*Sten Seifert

Fraunhofer institute for telecommunications, Heinrich Hertz institute Einsteinufer 37, 10587 Berlin, Germany, Germany

MoPI-4

Liquid-Phase Electroepitaxy of GaN at atmospheric pressure using ammonia and Ga-Ge solution 00069

*Daisuke Kanbayashi, Takeshige Hishida, Masafumi Tomita, Hiroyuki Takakura, Takahiro Maruyama, and Shigeya Naritsuka

Department of Materials Science and Engineering, Meijo University, Japan

MoPI-5

Wide energy level control of InAs QDs using double-capping procedure by MOVPE 0006;

*Masayuki Yamauchi, Yuto Iwane, Shohei Yoshikawa, Yuta Yamamoto, and Kazuhiko Shimomura

Department of Engineering and Applied Sciences, Sophia University, Japan

MoPI-6

Analysis of photoluminescent properties of InAs/InGaAsP/InP quantum dots structure 00073

*Rie Sato, Mariya Nakamura, and Hajime Imai

Faculty of Science, Japan Women's University, Japan

MoPI-7

Nature of the optical transition in (In,Ga)As(N)/GaP quantum dots (QDs): effect of QD size, indium composition and nitrogen incorporation 00075

*Cedric Robert(*1), Charles Cornet(*1), Katiane Pereira Da Silva(*2), Pascal Turban(*3), Samuel Mauger(*4), Tra Nguyen Thanh(*1), Jacky Even(*1), Jean-Marc Jancu(*1), Mathieu Perrin(*1), Hervé Folliot(*1), Tony Rohel(*1), Sylvain Tricot(*3), Andrea Balocchi(*5), Philippe Barate(*5), Xavier Marie(*5), Paul M Koenraad(*4), Maria Isabel Alonso(*2), Alejandro Rodolfo Goñi(*2,*6), Nicolas Bertru(*1), Olivier Durand(*1), and Alain Le Corre(*1)

*(*1)CNRS UMR 6082 FOTON-OHM, INSA Rennes, France, (*2)Institut de Ciencia de Materials de Barcelona-CSIC, Spain, (*3)UMR URI-CNRS 6251, Equipe de Physique des Surfaces et Interfaces, Institut de Physique de Rennes, France, (*4)Department of Applied Physics, Eindhoven University of Technology, Netherlands, (*5)LPCNO, INSA-CNRS-UPS, Université de Toulouse, France, and (*6)ICREA, Spain*

MoPI-8

Optimizing The Double-Cap Procedure for InAs/InGaAsP/InP Quantum Dots by

Metal-Organic Chemical Vapor Deposition 0007

Shuai Luo, Haiming Ji, Xiaoguang Yang, and *Tao Yang

Key Laboratory of Semiconductor Materials Science, Institute of semiconductors, Chinese Academy of Sciences., China

MoPI-9

Junction Field-Effect Transistor Based on GaAs Core-Shell Nanowires 00079

Oliver Benner, Andrey Lysov, Christoph Gutsche, *Gregor Keller, Claudia Schmidt, Werner Prost, and Franz-Josef Tegude

Solid State Electronics Department , University Duisburg-Essen, Germany

MoPI-10

MOVPE-preparation of Si(111) surfaces for III-V nanowire growth 0007;

Matthias Steidl(*1,*2), Agnieszka Paszuk(*1,*2), Weihong Zhao(*1,*2), Sebastian Brückner(*1,*2), Anja Dobrich(*2), *Oliver Supplie(*2,*3), Johannes Luczak(*2), Peter Kleinschmidt(*1,*2,*4), Henning Döscher(*1,*2), and Thomas Hannappel(*1,*2,*4)

*(*1)Technische Universität Ilmenau, Institut für Physik, Germany, (*2)Helmholtz-Zentrum Berlin, Institute Solar Fuels, Germany, (*3)Humboldt-Universität zu Berlin, Institut für Physik, Germany, and (*4)CiS Forschungsinstitut für Mikrosensorik und Photovoltaik, Germany*

MoPI-12

Bandgap Wavelength Shift in Quantum Well Intermixing using Different SiO₂ masks for Photonic Integration 00083

*Jieun Lee(*1), Yoshiaki Yamahara(*1), Mitsuaki Futami(*1), Takahiko Shindo(*2), Tomohiro Amemiya(*2), Nobuhiko Nishiyama(*1), and Shigehisa Arai(*1,*2)

*(*1)Department of Electrical and Electronic Engineering, Tokyo Institute of Technology, Japan and (*2)Quantum Nanoelectronics Research Center, Japan*

MoPI-13

Carrier-transport, Optical and Structural Properties of Large Area ELOG InP on Si Using Conventional Optical Lithography 00085

*Himanshu Kataria, Wondwosen Metaferia, Mony Nagarajan, Carl Junesand, Yanting Sun, and Sebastian Lourdudoss

Laboratory of Semiconductor Materials, KTH- Royal Institute of Technology, Sweden

MoPI-14

Low Power Consumption Operation of Light Sources for Inter-chip Optical

Interconnects 00087

*Nobuaki Hatori(*1,*2), Takanori Shimizu(*1,*2), Makoto Okano(*2,*3), Masashige shizaka(*1,*2), Tsuyoshi Yamamoto(*1,*2), Yutaka Urino(*1,*2), Masahiko Mori(*2,*3), Takahiro Nakamura(*1,*2), and Yasuhiko Arakawa(*2,*4)

*(*1)PETRA, Japan, (*2)PECST, Japan, (*3)AIST, Japan, and (*4)Univ. of Tokyo, Japan*

MoPI-15

1540 to 1645 nm continuous VCSEL emission based on quantum dashes 00089

*Cyril Paranthoen(*1), Christophe Levallois(*1), Jean-Philippe Gauthier(*2), Fethallah Taleb(*1), Nicolas Chevalier(*1), Mathieu Perrin(*1), Yoan Leger(*1), Olivier De Sagazan(*2), and Alain Le Corre(*1)

*(*1)FOTON, INSA, France and (*2)IETR, Université Rennes 1, France*

MoPI-16

InAs/InP Quantum dot mode-locked lasers grown on (113)B InP substrate 0008;

Kamil Klaime(*1), Cosimo Calo(*2), Rozenn Piron(*1), *Cyril Paranthoen(*1), Thomas Batte(*1), Olivier Dehaese(*1), Julie Le Pouliquen(*1), Slimane Loualiche(*1), Alain Le Corre(*1), Kamel Merghem(*2), Anthony Martinez(*2), and Abderrahim Ramdane(*2)

*(*1)UEB INSA-RENNES, CNRS UMR6082 FOTON, FRANCE, France and (*2)CNRS LPN MARCOUSSIS, FRANCE, France*

MoPI-17

Analysis of Uni-Traveling-Carrier Photodetectors (UTC-PDs) with Dipole-Doped

Interface 0003

*Qianqian Meng(*1), Chongyang Liu(*1), Hong Wang(*1,*2), Kian Siong Ang(*1), Manoj Kumar C M(*1), Tina Xin Guo(*1), and Bo Gao(*1,*3)

*(*1)Temasek Laboratories, Nanyang Technological University, Singapore, (*2)School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore, and (*3)School of Electronic and Information Engineering, Xian Jiaotong University, China*

MoPI-18

Multi-regrowth steps for the realization of buried single ridge and μ -stripes quantum cascade lasers 0005

*Olivier Parillaud(*1), Guy-Maël De Naurois(*1), Bouzid Simozrag(*1), Virginie Trinite(*1), Grégory Maisons(*1), Michel Garcia(*1), Bruno Gerard(*1), Mathieu Carras(*1), Wondwosen Metaferia(*2), Carl Junesand(*2), Himanshu Kataria(*2), Yanting Sun(*2), and Sebastian Lourdudoss(*2)

*(*1)III-V Lab, France and (*2)KTH - Royal Institute of Technology, Sweden*

MoPI-19

Mid-infrared photodetectors with InAs/GaSb type-II quantum wells grown on InP substrate 0007

*Hiroshi Inada(*1), Kouhei Miura(*1,*2), Yasuhiro Iguchi(*1), Yuuichi Kawamura(*2), Junpei Murooka(*3), Haruyoshi Katayama(*3), Shota Kanno(*4), Tomoko Takekawa(*4), and Masafumi Kimata(*3,*4)

*(*1)Transmission Devices R&D Laboratories, Sumitomo Electric Industries, Ltd., Japan, (*2)Frontier Science Innovation Center, Osaka Prefecture University, Japan, (*3)Japan Aerospace Exploration Agency (JAXA), Japan, and (*4)Department of Mechanical Engineering, Ritsumeikan University, Japan*

MoPI-20

Cryogenic DC Characterization of InAs/Al₅₀Ga₂₀Sb Self-Switching Diodes 0009

*Andreas Westlund(*1), Giuseppe Moschetti(*1), Per-åke Nilsson(*1), Jan Grahn(*1), Ludovic Desplanque(*2), and Xavier Wallart(*2)

*(*1)Department of Microtechnology and Nanoscience, Chalmers University of Technology, Sweden and (*2)Institute of Electronics, Microelectronics and Nanotechnology, University of Lille, France*

MoPI-21

Cryogenic Ultra-Low Noise Amplification - InP PHEMT vs. GaAs MHEMT 0009;

*Joel SchleeH, Helena Rodilla, Niklas Wadefalk, Per-åke Nilsson, and Jan Grahn

Department of Microtechnology and Nanoscience (MC2), Chalmers University of Technology, Sweden

MoPI-22

High Performacne InAs/AlSb HEMT with Refractory Iridium Schottky Gate Metal 0000 3

*Wen-Yu Lin(*1), Chao-Hung Chen(*1), Hsien-Chin Chiu(*1), Wei-Jen Hsueh(*2), Yue-Ming Hsin(*2), and Jen-Inn Chyi(*2)

*(*1)Chang Gung Univ., Taiwan and (*2)National Central Univ., Taiwan*

MoPI-23

Influence of gate-channel distance in low-noise InP HEMTs 0000 5

*Per-Ake Nilsson, Helena Rodilla, Joel SchleeH, Niklas Wadefalk, and Jan Grahn

Department of Microtechnology and Nanoscience, Chalmers University of Technology, Sweden

MoPI-24

Terahertz Oscillators using Resonant Tunneling Diodes with InAlGaAs/InP Composite Collector 0000 7

*Riku Sogabe(*1), Kaoru Shizuno(*1), Hidetoshi Kanaya(*1), Safumi Suzuki(*1), Masahiro Asada(*1), Hiroki Sugiyama(*2), and Haruki Yokoyama(*2)

*(*1)Graduate School of Interdisciplinary Science and Engineering, Tokyo Institute of Technology, Japan and (*2)NTT Photonics Laboratories, NTT Corporation, Japan*

MoPI-25

120nm AlSb/InAs HEMT without gate recess : 290GHz f_T and 335GHz f_{max} 0000 9

*Cyrille Gardès, Sonia Marcelle Bagumako, Ludovic Desplanque, Nicolas Wichmann, François Danneville, Sylvain Bollaert, Xavier Wallart, and Yannick Roelens

Institut d'Electronique de Microélectronique et de Nanotechnologie (IEMN), France

MoPI-26

Monte Carlo Simulation of InAlAs/InGaAs HEMTs with Buried Gate 0000 ;

*Akira Endoh(*1,*2), Issei Watanabe(*1), Akifumi Kasamatsu(*1), and Takashi Mimura(*1,*2)

*(*1)National Institute of Information and Communications Technology, Japan and (*2)Fujitsu Laboratories Ltd., Japan*

MoPI-27

Terahertz GaAs Schottky diode mixer and multiplier MICs based on e-beam technology (000) 3

*Vladimir Drakinskiy(*1), Peter Sobis(*2), Huan Zhao(*1), Tomas Bryllert(*1,*3), and Jan Stake(*1)

(*1)Department of Microtechnology and Nanoscience, Chalmers University of Technology, Sweden,

(*2)Omnisys Instruments AB, Sweden, and (*3)Wasa Millimeter Wave AB, Sweden

MoPI-28

Simulation and Fabrication of InGaAs Planar Gunn Diode on InP Substrate (000) 5

*Vasileios Papageorgiou, Ata Khalid, Chong Li, and David R. S. Cumming

School of Engineering, University of Glasgow, United Kingdom

MoPI-29

5 GHz Low-Power RTD-Based Amplifier MMIC With a High Figure-Of-Merit of 24.5 dB/mW (000) 7

*Jongwon Lee, Jooseok Lee, Jaehong Park, and Kyoungsoon Yang

Department of Electrical Engineering, KAIST, Republic of Korea

Tuesday, May 21, 2013

TuD1

Epitaxy for Advanced Devices

TuD1-2 (invited) 9:00 - 9:30

Light emission between 2 and 4 μm : Innovative active region designs for InP- and GaSb-based devices (000) 9

Gerhard Boehm, *Stephan Sprengel, Kristijonas Vizbaras, Christian Grasse, Tobias Gruendl, Ralf Meyer, and Markus-Christian Amann

Walter Schottky Institut, Technische Universitaet Muenchen, Germany

TuD1-3 9:30 - 9:45

MOCVD Growth and Device Characterization of InP/GaAsSb/InP DHBTs with a GaAs Spacer (000) ;

*Takuya Hoshi, Hiroki Sugiyama, Haruki Yokoyama, Norihide Kashio, Kenji Kurishima, Minoru Ida, and Hideaki Matsuzaki

NTT Photonics Laboratories, NTT Corporation, Japan

TuD1-4 9:45 - 10:00

High Growth Rate Gallium Phosphide for Red LEDs 000B23

*Stephen Farrell(*1), Chris Ebert(*2), and Devon Dyer(*3)

(*1)*Veeco Instruments, Inc., United States of America*, (*2)*Veeco Instruments, Inc., United States of America*, and (*3)*Veeco Instruments, Inc., United States of America*

TuD1-5 10:00 - 10:15

MOCVD growth of carbon-doped InGaAs layers using ethyl-base metal organic materials 000B25

*Hideo Yokohama(*1,*2), Kenji Shiojima(*1), and Gako Araki(*2)

(*1)*Graduate School of Electrical and Electronics Engineering, University of Fukui, Japan* and (*2)*OPTRANS Corporation, Japan*

TuD2

Lasers

TuD2-1 (invited) 11:00 - 11:30

High-speed directly modulated laser for applications beyond 100GbE 000B27

*Wataru Kobayashi, Takeshi Fujisawa, Toshio Ito, Takayuki Yamanaka, Yasuo Shibata, Takashi Tadokoro, and Hiroaki Sanjoh
NTT, Japan

TuD2-2 11:30 - 11:45

Simultaneous 40-Gbps Direct Modulation of 1.3- μ m Wavelength AlGaInAs

Distributed-Reflector Laser Arrays on Semi-Insulating InP Substrate 000B29

*Manabu Matsuda, Ayahito Uetake, Takasi Simoyama, Shigekazu Okumura, Kazumasa Takabayashi, Mitsuru Ekawa, and Tsuyoshi Yamamoto
Fujitsu Laboratories Ltd., Japan

TuD2-3 11:45 - 12:00

Static and dynamic characteristics of InAs/AlGaInAs/InP quantum dot lasers operating at 1550 nm 000B2;

*Johann Peter Reithmaier(*1), Vitalii Ivanov(*1), Vitalii Sichkovskiy(*1), Christian Gilfert(*1), Anna Rippien(*1), Florian Schnabel(*1), David Gready(*2), and Gadi Eisenstein(*2)

(*1)*Institute of Nanostructure Technologies and Analytics, University of Kassel, Germany and*

(*2)*Department of Electrical Engineering, Technion, Israel*

TuD2-4 12:00 - 12:15

Frequency-resolved optical gating measurements of sub-ps pulses from InAs/InP quantum dash based mode-locked lasers 000B33

*Cosimo Calò(*1), Holger Schmeckeber(*2), Kamel Merghem(*1), Ricardo Rosales(*1,*2), François Lelarge(*3), Anthony Martinez(*1), Dieter Bimberg(*2), and Abderrahim Ramdane(*1)

(*1)*CNRS Laboratory for Photonics and Nanostructures, France, (*2)Institut für Festkörperphysik, Technische Universität Berlin, Germany, and (*3)III-V Lab, France*

TuD2-5 12:15 - 12:30

1480nm InGaAsP LOC Broad-Area-Lasers with >18W Pulsed Output Power at 20°C 000B35

*David Fendler, Martin Moehrle, Marc Spiegelberg, Wolfgang Rehbein, Wolfgang Passenberg, and Norbert Grote

Fraunhofer Institute for Telecommunications, Heinrich-Hertz-Institute, Germany

TuD3 **Devices for Photonic Integration**

TuD3-1 (invited) 14:00 - 14:30

Monolithically Integrated Optical Link Using Photonic Crystal Laser and Photodetector 000B37

*Shinji Matsuo(*1,*2)

(*1)*NTT Photonics Laboratories, NTT Corporation, Japan and (*2)Nanophotonics Center, NTT Corporation, Japan*

TuD3-2 14:30 - 14:45

Low Crosstalk and High Modulation Bandwidth 100GbE Optical Transmitter Using Flip-Chip Interconnects 000B39

*Shigeru Kanazawa, Takeshi Fujisawa, Kiyoto Takahata, Akira Ohki, Ryuzo Iga, and Hiroyuki Ishii
NTT Photonics Laboratories, Japan

TuD3-3 14:45 - 15:00

Non-blocking 4x4 InAlGaAs/InAlAs Mach-Zehnder-Type Optical Switch Fabric 000B3;

Noriaki Koyama(*1), *Hiroki Kouketsu(*1), Shoko Kawasaki(*1), Aki Takei(*2), Takafumi Taniguchi(*2), Yuichi Matsushima(*3), and Katsuyuki Utaka(*1)
*(*1)Faculty of Science and Engineering, Waseda University, Japan, (*2)Central Research Laboratory, Hitachi Ltd., Japan, and (*3)Green Computing System Research Organization, Waseda University, Japan*

TuD3-4 15:00 - 15:15

Design of Multi-Functional GaInAsP/Si Hybrid Semiconductor Optical Amplifier Array with AlInAs-Oxide Current Confinement Layer 000B43

*Yusuke Hayashi(*1), Keita Fukuda(*1), Ryo Osabe(*1), Jun-Ichi Suzuki(*1), Joonhyun Kang(*1), Yuki Atsumi(*1), Nobuhiko Nishiyama(*1), and Shigehisa Arai(*1,*2)
*(*1)Department of Electrical and Electronic Engineering, Tokyo Institute of Technology, Japan and (*2)Quantum Nanoelectronics Research Center, Tokyo Institute of Technology, Japan*

TuD3-5 15:15 - 15:30

New Fabrication Method of Trapezoidal Polarization Converters for InP-Based Photonic Integrated Circuits 000B45

*Dzmitry O. Dzibrou, Jos J. G. M. van der Tol, and Meint K. Smit
Group of Photonic Integration, Eindhoven University of Technology, Netherlands

TuD3-6 15:30 - 15:45

Butt-Joint Built-in (BJB) Structure for Membrane Photonic Integration 000B47

*Daisuke Inoue(*1), Jieun Lee(*1), Takahiko Shindo(*2), Mitsuaki Futami(*1), Kyohei Doi(*1), Tomohiro Amemiya(*2), Nobuhiko Nishiyama(*1), and Shigehisa Arai(*1,*2)
*(*1)Department of Electrical and Electronic Engineering, Tokyo Institute of Technology, Japan and (*2)Quantum Nanoelectronics Research Center, Tokyo Institute of Technology, Japan*

TuD3-7LN 15:45 - 16:00

Tunable InP Photonic Integrated Circuit for Millimeter Wave Generation 000B49

*Marco Lamponi(*1), Mourad Chtioui(*2), François Lelarge(*1), Gaël Kervella(*1), Efthymios Rouvalis(*3), Cyril Renaud(*3), Martyn Ficek(*3), Guillermo Carpintero(*4), Frederic van Dijk(*1) (*1)III-V Lab, a joint Laboratory of "Alcatel Lucent Bell Labs", "Thales Research & Technology" and "CEA-LETI", Palaiseau, France, (*2)Thales Air Systems, 91470 Limours, France, (*3)Department of Electronic and Electrical Engineering, UCL, Torrington Place, WC1E 7JE, United Kingdom, and (*4)Universidad Carlos III de Madrid, Av de la Universidad, 30 Leganes 28911 Madrid, Spain

TuD4

Integrated Devices

TuD4-1 (invited) 16:30 - 17:00

AlGaInAs Selective Area Growth for high-speed EAM-based PIC Sources 000B4;

*Jean Decobert(*1), Pierre-Yves Lagree(*2), Hugues Guerault(*3), and Christophe Kazmierski(*1) (*1)III-V lab, Route de Nozay, 91460 Marcoussis, France, (*2)CNRS, UPMC Univ Paris 06, IJLRA, 75005 Paris, France, and (*3)Bruker AXS GmbH, O. Rheinbrueckenstr. 49, 76187 Karlsruhe, Germany

TuD4-2 17:00 - 17:15

56Gb/s PDM-BPSK Experiment with a Novel InP-Monolithic Source Based on Prefixed Optical Phase Switching 000B53

*Christophe Kazmierski(*1), Nicolas Chimot(*1), Fabrice Blache(*1), Jean Decobert(*1), Francois Alexandre(*1), Jorg Honecker(*2), Christoph Leonhardt(*2), Andreas Steffan(*2), Oriol Bertran-Pardo(*3), Haik Mardoyan(*3), Jeremie Renaudier(*3), and Gabriel Charlet(*3) (*1)III-V Lab, France, (*2)U2T Photonics, Germany, and (*3)Alcatel-Lucent, Bell Labs, France

TuD4-3 17:15 - 17:30

InP-based Compact Reflection-Type Transversal Filter 000B55

*Yuta Ueda, Takeshi Fujisawa, Kiyoto Takahata, Masaki Kohtoku, Hiroshi Takahashi, and Hiroyuki Ishii
NTT Photonics Laboratories, NTT Corporation, Japan

TuD4-4 17:30 - 17:45

Transmitter PIC for THz Applications Based on Generic Integration Technology 000B57

*Norbert Grote

Fraunhofer Heinrich-Hertz-Institut, Germany

TuD4-5 17:45 - 18:00

Intermixng of Highly-Stacked InAs/InGaAlAs Quantum Dots Grown on InP(311)B

Substrate by SiO₂ Sputtering and Annealing Technique 000B59

*Asuka Matsushita(*1), Atsushi Matsumoto(*1), Kouichi Akahane(*2), Yuichi Matsushima(*3), and Katsuyuki Utaka(*1)

*(*1)Faculty of Science and Engineering, Waseda University, Japan, (*2)National Institute of Information and Communications Technology, Japan, and (*3)Green Computing System Research Organization, Waseda University, Japan*

Wednesday, May 22, 2013

WeD1

III-V MOSFETs

WeD1-1 8:30 - 8:45

High Transconductance Surface Channel In_{0.53}Ga_{0.47}As MOSFETs Using MBE

Source-Drain Regrowth and Surface Digital Etching 000B5;

*Sanghoon Lee(*1), Cheng-Ying Huang(*1), Andrew D. Carter(*1), Jeremy J. M. Law(*1), Doron C. Elias(*1), Varistha Chobpattana(*2), Brian J. Thibeault(*1), William Mitchell(*1), Susanne Stemmer(*2), Arthur C. Gossard(*2), and Mark J. W. Rodwell(*1)

*(*1)Department of Electrical and Computer Engineering, UCSB, United States of America and (*2)Material Department, UCSB, United States of America*

WeD1-2 8:45 - 9:00

Sub-50-nm InGaAs MOSFET with n-InP source on Si substrate 000B63

*Atsushi Kato, Toru Kanazawa, Eiji Uehara, Yoshiharu Yonai, and Yasuyuki Miyamoto
Tokyo Institute of Technology, Japan

WeD1-3 9:00 - 9:15

Analysis on channel thickness fluctuation scattering in InGaAs-OI MOSFETs 000B65

*Sanghyeon Kim(*1), Masafumi Yokoyama(*1), Ryosho Nakane(*1), Osamu Ichikawa(*2), Takenori Osada(*2), Masahiko Hata(*2), Mitsuru Takenaka(*1), and Shinichi Takagi(*1)

(*1)The University of Tokyo, Japan and (*2)Sumitomo Chemical Co. Ltd., Japan

WeD1-4 9:15 - 9:30

Impact of Al₂O₃ ALD temperature on Al₂O₃/GaSb metal-oxide-semiconductor interface properties 000B67

*Masafumi Yokoyama(*1), Yuji Asakura(*1), Haruki Yokoyama(*2), Mitsuru Takenaka(*1), and Shinichi Takagi(*1)

(*1)The University of Tokyo, Japan and (*2)NTT Photonics Laboratories, NTT Corporation, Japan

WeD1-5 9:30 - 9:45

1/f-noise in Vertical InAs Nanowire Transistors 000B69

*Karl-Magnus Persson, Martin Berg, Erik Lind, and Lars-Erik Wernersson

Dept. of Electrical- and Information Technology, Lund University, Sweden

WeD2

Integrated Lasers

WeD2-1 (invited) 10:30 - 11:00

InP Based Photonic Integrated Circuits For DWDM Optical Communication 000B6;

*Beck Mason, Michael Larson, Yuliya Akulova, and Srinath Kalluri

JDSU Transmission R&D, United States of America

WeD2-2 11:00 - 11:15

17-Gb/s Direct Modulation of Lambda-scale Embedded Active Region Photonic Crystal Lasers 000B73

*Koji Takeda(*1,*3), Tomonari Sato(*1,*3), Akihiko Shinya(*2,*3), Kengo Nozaki(*2,*3), Hideaki Taniyama(*2,*3), Koichi Hasebe(*1,*3), Takaaki Kakitsuka(*1,*3), Masaya Notomi(*2,*3), and Shinji Matsuo(*1,*3)

(*1)NTT Photonics Labs., Japan, (*2)NTT Basic Res. Labs., Japan, and (*3)Nanophotonics Center, Japan

WeD2-3 11:15 - 11:30

Room-temperature Continuous-wave Operation of Lateral Current Injection

Membrane Laser 000875

*Kyohei Doi(*1), Takahiko Shindo(*2), Mitsuaki Futami(*1), Jieun Lee(*1), Takuo Hiratani(*1), Daisuke Inoue(*1), Shu Yang(*1), Tomohiro Amemiya(*2), Nobuhiko Nishiyama(*1), and Shigehisa Arai(*1,*2)

(*1)Department of Electrical and Electronic Engineering, Tokyo Institute of Technology, Japan and

(*2)Quantum Nanoelectronics Research Center, Tokyo Institute of Technology, Japan

WeD2-4 11:30 - 11:45

Mode Locked InAs/InP Quantum dash based DBR Laser monolithically integrated with a semiconductor optical amplifier 000877

*Siddharth Joshi(*1), Nicolas Chimot(*1), Ricardo Rosales(*2), Sophie Barbet(*1), Alain Accard(*1), Abderrahim Ramdane(*2), and Francois Lelarge(*1)

(*1)3-5 Lab, Marcoussis, France and (*2)Laboratoire de Photonique et de Nanostructures, CNRS, France

Thursday, May 23, 2013

ThD1

THz Detectors and Generators

ThD1-1 (invited) 8:30 - 9:00

Asymmetric dual-grating gate InGaAs/InAlAs/InP HEMTs for ultrafast and ultrahigh sensitive terahertz detection 000879

*Taiichi Otsuji(*1), Takayuki Watanabe(*1), Stephane Boubanga Tombet(*1), Tetsuya Suemitsu(*1), Dominique Coquillat(*2), Wojciech Knap(*2), Denis Fateev(*3), and Vyacheslav Popov(*3)

(*1)Tohoku University, Japan, (*2)University of Montpellier and CNRS, France, and (*3)Kotelnikov Institute of Radio Engineering and Electronics (Saratov Branch), RAS, Russia

ThD1-2 9:00 - 9:15

Improvement in Nonlinear Characteristics of Zero Bias GaAsSb-based Backward

Diodes 00087;

*Tsuyoshi Takahashi(*1,*2), Masaru Sato(*1,*2), Yasuhiro Nakasha(*1,*2), and Naoki Hara(*1,*2)

(*1)Fujitsu Laboratories Ltd., Japan and (*2)Fujitsu Limited, Japan

ThD1-3 9:15 - 9:30

Characterization and Modeling of Zero Bias rf-Detection Diodes based on Triple Barrier Resonant Tunneling Structures 00083

*Gregor Keller(*1), Anselme Tchegho(*1), Benjamin Muenstermann(*1), Werner Prost(*1), Franz-Josef Tegude(*1), and Michihiko Suhara(*2)

(*1)Center for Semiconductor Technology and Optoelectronics, University of Duisburg-Essen, Germany and (*2)Electrical and Electronic Engineering, Graduate School of Science and Engineering, Tokyo Metropolitan University, Japan

ThD1-4 9:30 - 9:45

Extremely-High Sensitive Terahertz Detector based on Dual-Grating Gate InP-HEMTs 00085

*Yuki Kurita(*1), Guillaume Ducournau(*2), Kengo Kobayashi(*1), Yahya M. Meziani(*3), Vyacheslav V. Popov(*4), Wojciech Knap(*5), and Taiichi Otsuji(*1)

(*1)RIEC, Tohoku University, Japan, (*2)IEMN, France, (*3)Universidad de Salamanca, Spain, (*4)Kotelnikov Institute of Radio Engineering and Electronics RAS, Russia, and (*5)Univ. Montpellier 2, CNRS, France

ThD1-5 9:45 - 10:00

High Performance Modulation Doped AlGaAs/InGaAs Thermopiles (H-PILEs) for Uncooled IR FPA Utilizing Integrated HEMT-MEMS Technology 00087

*Masayuki Abe(*1), Kian Siong Ang(*2), Rene Hofstetter(*2), Hong Wang(*2), and Geok Ing Ng(*2)

(*1)3D-bio Co., Ltd., Japan and (*2)Nanyang Technological University, Singapore

ThD1-6 10:00 - 10:15

Frequency Modulation in mm-Wave InGaAs MOSFET/RTD Wavelet Generators 00089

Mikael Egard, Mats Arlelid, Lars Ohlson, Mattias Borg, Erik Lind, and *Lars-Erik Wernersson
Electrical and Information Technology, Lund University, Sweden, Sweden

ThD1-7 10:15 - 10:30

Ultrashort pulse generators using resonant tunneling diodes with improved power performance 00088;

*Dongpo Wu, Jie Pan, Katsutaro Mizumaki, Masayuki Mori, and Koichi Maezawa
Graduate School of Science and Engineering, University of Toyama, Japan

ThD2

High-Speed Circuits and Devices

ThD2-1 (invited) 11:00 - 11:30

Sub-50nm Indium Phosphide High Electron Mobility Transistor Technology for Terahertz Monolithic Microwave Integrated Circuits and Systems 000893

*Stephen Sarkozy, Xiaobing Mei, Wayne Yoshida, Po-Hsin Lin, Ling-Shine Lee, Joe Zhou, Kevin Leong, Vesna Radisic, William Deal, and Richard Lai
Aerospace Systems, Northrop Grumman Corporation, United States of America

ThD2-2 11:30 - 11:45

35 nm mHEMT Technology for THz and ultra low noise applications 000895

*Arnulf Leuther, Axel Tessmann, Michael Dammann, Hermann Massler, Michael Schlechtweg, and Oliver Ambacher
Fraunhofer IAF, Germany

ThD2-3 11:45 - 12:00

250-290 GHz Amplifier in 75-nm InP HEMT Technology Using Inverted Microstrip Transmission Line 000897

*Hiroshi Matsumura, Shoichi Shiba, Masaru Sato, Tsuyoshi Takahashi, Toshihide Suzuki, Yasuhiro Nakasha, and Naoki Hara
Fujitsu Limited, Japan

ThD2-4 12:00 - 12:15

Comparative Study on Frequency Limits of Nanoscale HEMTs with Various Channel Materials 000899

*Yutaro Nagai(*1), Shohei Nagai(*1), Jun Sato(*1), Shinsuke Hara(*1), Hiroki I. Fujishiro(*1), Akira Endoh(*2), Issei Watanabe(*2), and Akifumi Kasamatsu(*2)
*(*1)Tokyo University of Science, Japan and (*2)National Institute of Information and Communication Technology, Japan*

ThD2-5 12:15 - 12:30

InP/InGaAs DHBT Technology Using SiN/SiO₂ Sidewall Spacers 000899;

*Norihide Kashio, Kenji Kurishima, Minoru Ida, and Hideaki Matsuzaki
NTT Photonics Laboratories, NTT Corporation, Japan