2016 PHOTONICS WEST

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ATTEND
FEBRUARY 2016

The Moscone Center
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13-18 February 2016

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The Premier Event for the Photonics and Laser Industries
BIOS—BIOMEDICAL OPTICS
OPTO—INTEGRATED OPTOELECTRONICS
LASER—LASERS AND APPLICATIONS
GREEN PHOTONICS
TRANSLATIONAL RESEARCH
3D FABRICATION
A low effective mass material system for quantum cascade detectors *(Invited Paper)*

Paper 9755-37
Time: 9:30 AM - 9:50 AM
Author(s): Peter Reininger, Tobias Zederbauer, Benedikt Schwarz, Hermann Detz, Donald MacFarland, Aaron M. Andrews, Werner Schrenk, Gottfried Strasser, Technische Univ. Wien (Austria)

We introduce InAs/AlAsSb as material system for quantum cascade detectors. The greatest benefit is the low effective mass of the well material that improves the total absorption of the detector and decreases the intersubband scattering rates, which increases the device resistance and thus enhances the noise behaviour. We have designed, grown, and measured a QCD that detects at a wavelength of $\lambda=4.84\mu$m and shows a peak specific detectivity of approximately $2.7\times10^7$ Jones at $T=300\text{K}$ and $2.87 \times 10^{10}$ Jones at $80\text{K}$.
CONFERENCE 9755

TUESDAY 16 FEBRUARY

SESSION 9 ....................................TUE 8:00 AM TO 8:30 AM

Keynote Session III

Imperceptible active sensors for cyber-physical systems (Keynote Presentation), Tsuyoshi Sekimoto, Osaka Univ. (Japan) ...........................................[9755-33]

SESSION 10 ..................................TUE 8:30 AM TO 10:10 AM

Infrared Detection I

Session Chairs: Philippe Christol, Institut d'Electronique du Sud (France); Michel Krakoewski, IV-Lab (France)

Radiation tolerance studies of long wavelength infrared InAs/InSb detectors (Invited Paper), Alexander Soibel, Sir Rafal, Anouk Krasnowitch, Jean Nguyen, Linda Higland, Anita Fisher, Sam Keo, David Ting, Sarah Gunapala, Jet Propulsion Lab. (USA) ...........................................[9755-34]

Mid-infrared interband cascade photodetectors with high quantum efficiency (Invited Paper), Zhao-Bing Tuong, The Univ. of New Mexico (USA); Anjali Singh, Kevin Rigg, Northrop Grumman Electronic Systems (USA); Sanjay Krishna, The Univ. of New Mexico (USA) ...........................................[9755-35]

Recent progress in interband cascade IR photodetectors (Invited Paper), Rui Gu, Yang, The Univ. of Oklahoma (USA) ...........................................[9755-35-56]

A low effective mass material system for quantum cascade detectors (Invited Paper), Peter Reinsier, Tobias Zderbauer, Benedict Schwartz, Hermann Deitz, Donald MacFarland, Aaron M. Andrews, Werner Schrenk, Gottfried Stasser, Technische Univ. (Austria) ...........................................[9755-37]


SESSION 11 ..................................TUE 10:40 AM TO 12:00 PM

Infrared Detection II

Session Chairs: Gail J. Brown, Air Force Research Lab. (USA); Jan Misiewicz, Wrocław Univ. of Technology (Poland)

Metamorphic InAsSb/InAsSb heterostructures: new materials for infrared photodetectors (Invited Paper), Gregory Belenky, Youxi Lin, Leon Sherenag, Dmytri V. Donevsky, Gisa Kipputz, Sergey Suchalbin, Brian Broox (USA); Wendy L. Samey, Stefan P. Bresnanc, U.S. Army Research Lab. (USA) ...........................................[9755-39]

Surface plasmonic resonance enhanced type II strained-layer superlattice photodetector (Invited Paper), Guang Gu, Stony Brook College (USA); Jarrod N. Vaillavcourt, Applied Nanoemto Technologies LLC (USA); Xuqun Lu, Univ. of Massachusetts Lowell (USA) ...........................................[9755-40]

Photoluminescence studies of InAs/InSb type-II infrared superlattices (Invited Paper), Elizabeth H. Steenberg, Air Force Research Lab. (USA); Jeremy A. Massengale, The Univ. of Oklahoma (USA); Yong-Hang Zhang, Arizona State Univ. (USA) ...........................................[9755-41]

InAs-based type-II superlattices long wavelength infrared photodetectors (Invited Paper), Xianjun Chen, Fengjiang Wang, Zhicheng Xu, Yi Zhou, Ling, Shanghai Institute of Technical Physics (China) ...........................................[9755-42]

Lunch/Exhibition Break ..........................TUE 12:00 pm to 1:30 pm

SESSION 12 ..................................TUE 1:30 PM TO 3:30 PM

Nanophotonics and Plasmonics I

Session Chairs: John M. Zavada, Polytechnic Institute of New York Univ. (USA); Jean-Pierre Huignard, Iphofen (France)

Metamaterial-based nanophotonic and nanophotodetectors (Invited Paper), Emin Ozay, Bilkent Univ. (Turkey) ...........................................[9755-43]

Optimization of plasmonic grating resonators based on III-V semiconductors for sensing applications using 3D finite-difference time-domain simulations (Invited Paper), Francioso B. Barho, Maria Jose Milla Rodriguez, Fernando Gonzalez-Pousada Flores, Thierry Taccierre, Univ. Montpellier 2 (France) ...........................................[9755-44]

Tuning of the localized surface plasmon wavelength in highly-doped InAsSb/InGaSb nanostructures (Invited Paper), Maria Jose Milla Rodriguez, Francesc B. Barho, Istituto di Elettronica del Sud (France); Fernando Gonzalez-Pousada Flores, Commissionat a l'Enginyeratmique (France); Laurent Cugnot, Univ. Montpellier 2 (France); Jean-Baptiste Rodriguez, Eric Toumi, Thierry Taccierre, Istituto di Elettronica del Sud (France) ...........................................[9755-45]

Sporadically mirror-symmetric breaking in two coupled nanolasers (Invited Paper), Philippe Bogdanov, Mikhail Y. Shikov, Jing Liu, Jean-Aubry Levenson, Alejandro M. Giacomelli, Lab. de Photonique et de Nanostructures (France) ...........................................[9755-46]

Theoretical and experimental investigations of optically excited VECSB (Invited Paper), Ghaya Bell, Alexandre Joly, Thales Research & Technology (France); Julien Frazhier, Unité de Physique CNRS/Thales (France); Mehdi Aouakil, Institut de Physique de Rennes (France); Jean-Marie George, Unité de Physique CNRS/Thales (France); Thierry Besançon, Lab. de Photonique et de Nanostructures (France); Daniel Dolfi, Thales Research & Technology (France) ...........................................[9755-47]

Dynamic control of chaotic resonators (Invited Paper), Andrea Di Falco, Univ. of St. Andrews (United Kingdom); Roman Brouck, Univ. of Southampton (United Kingdom); Changlin Liu, King Abdullah Univ. of Science and Technology (Saudi Arabia); Otto L. Muskens, Univ. of Southampton (United Kingdom); Andrea Fratalocchi, King Abdullah Univ. of Science and Technology (Saudi Arabia) ...........................................[9755-48]

SESSION 13 ..................................TUE 4:00 PM TO 6:00 PM

Nanophotonics and Plasmonics II

Session Chairs: Ekrem Ozay, Bilkent Univ. (Turkey); Dimitris Pavlidis, Bournemouth Univ. (USA)

Quantum photodetectors with color centers in diamond and nanophotonic structures (Invited Paper), Simeon Bogdanov, Mikhail Y. Shikov, Jing Liu, Purdue Univ. (USA); Vadim V. Vorobyov, Photonics Nano-Meta Technologies (Russia); Polina V. Kapliakova, ITMO Univ. (Russia); Marcello Ferrera, Heron View Films (United Kingdom); Alexei Lazarevich, Bilkent Univ. (USA); Alexey V. Alimov, Russian Quantum Ctrl (Russian Federation); Pavel A. Belov, TUMO (Russia); Alexander V. Kildishev, Joseph M. Ideczerayar, Alexander B. Balandin, Vadim M. Shalaev, Purdue Univ. (USA) ...........................................[9755-49]

Is super-Planckian thermal emission possible in the far field? (Invited Paper), Francois Marquer, Jean-Jacques Grefaft, Institut d'Optique Graduate School (France); Patrick Bouchon, ONERA (France); Guillaume Bruck, Institut d'Optique Graduate School (France) ...........................................[9755-50]

Integrated spectral and dispersion sensors based on nanomechanical photonic crystals (Invited Paper), Zahi Zibonicia, Rob W. van der Heijden, Mauricio Patrussella, Francesco M. Pagano, Tuan Xa, Leonardo Midda, Yong Link Cho, Frank W. M. van Otten, Andrea Fiore, Technische Univ. Eindhoven (Netherlands) ...........................................[9755-51]

Simple analytical treatment of the interaction between light, plasmonic, and quantum resonances: the quasi-normal mode expansion (Invited Paper), Matthias Perrin, Jang Yang, Univ. Bordeaux 1 (France); Christophe Sauven, Jean-Paul Hugonin, Lab. Charles Fabry (France); Philippe Lalanne, Lab. Charles Fabry (France) and Univ. Bordeaux 1 (France) ...........................................[9755-52]

Optical Kellholz resonators (Invited Paper), Patrick Bouchon, Paul Chemerlin, ONERA (France); Fabrice Perdo, Lab. de Photonique et de Nanostructures (France); Red Holder, ONERA (France) ...........................................[9755-53]

Enhanced second-harmonic generation from magnetic resonance in InGaAs nanowires (Invited Paper), Costantino de Angelis, Andrea Locatelli, Luca Coretti, Univ. degli Studi di Brescia (Italy); Oskars D. Stepanauskas, Giuseppe Leo, Univ. Parks 7-Jenei Driezeit (France) Giuseppe Marino, Nicola Olivieri, Atalaya V. Zelaya, King's College London (United Kingdom) ...........................................[9755-54]