SPIE. PHOTONICS WEST OPTO

The Moscone Center
San Francisco, California, United States
28 January - 2 February 2017

Quantum Sensing and Nano Electronics and Photonics XIV

Sunday - Thursday 29 January - 2 February 2017

Conference Sessions At A Glance

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Welcome and Opening Remarks
1: Keynote Session I
2: Quantum Cascade Lasers for Gas Sensing
3: Sensing Application of Quantum Cascade Lasers
4: Mid-Infrared Interband Lasers and Applications
OPTO Plenary Session
5: Keynote Session II
6: Terahertz Technology: Lasers, Detectors, and Imaging
7: Advances in Photonics
8: Keynote Session III
9: Infrared Detection I
10: Keynote Session IV
11: Infrared Detection II
12: Keynote Session V
13: Quantum Detectors
14: Nanophotonics and Plasmonics
15: Nanophotonics and Metasurfaces
—CANCELED—Late-Breaking Results and Awards for Breakthroughs in Human-Centered Research
16: Keynote Session VI
17: Nonlinear Photonics
18: 2D Materials for Photonics
19: Keynote Session VII
20: Nano- and Opto-Mechanics
21: IR Laser/Detector Development
Posters-Wednesday
22: Keynote Session VIII
23: Frontiers in Quantum Technologies
24: Quantum Dots and Nanostructures I
25: Keynote Session IX
26: Quantum Dots and Nanostructures II
27: Advanced Optical Spectroscopy Techniques

Important Dates

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Abstract Due:
18 July 2016

Author Notification:
26 September 2016

Manuscript Due Date:
21 November 2016

Conference Committee

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Session 21:
IR Laser/Detector Development

Wednesday 1 February 2017
4:00 PM - 5:40 PM
Location: Room 304 (South Esplanade)

Session Chair: Ivan Favero, Univ. Paris 7-Denis Diderot (France)

Quantum cascade detector at 4.3µm wavelength in pixel array configuration
Paper 10111-83
Time: 4:00 PM - 4:15 PM
Author(s): Andreas Harrer, Benedikt Schwarz, Simone Schuler, Peter Reininger, Technische Univ. Wien (Austria); Alexander Wirthmüller, Univ. de Neuchâtel (Switzerland); Mpsi Technologies GmbH (Germany); Hermann Detz, Austrian Academy of Sciences (Austria); Donald MacFarland, Tobias Zederbauer, Aaron M. Andrews, Technische Univ. Wien (Austria); Mario Rothermund, Hermann Oppermann, Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration (Germany); Werner Schrenk, Gottfried Strasser, Technische Univ. Wien (Austria)

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We present a high performance InGaAs/InAlAs quantum cascade detector design suitable for pixel devices. The pixels are fully compatible with standard processing technology and material growth to provide scalability to large pixel counts. An enhanced quantum cascade detector simulator is used for design optimization of the resistance and extraction efficiency while maintaining a high responsivity. The device is thermo-compression bonded to a custom read out integrated circuit with substrate bottom side illuminated pixels. A room temperature responsivity of 16mA/W and a detectivity of 5·10^7 cm√Hz/W was achieved in good agreement with our simulation results. Device packaging and thermo-electric cooling in an N2 purged 16 pin TO-8 housing has been investigated additionally.