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CLEO: Applications & Technology

ATh1J • Applications of Semi Conductor Lasers—Continued

ATh1J.5 • 09:15
Hybrid Colloidal Quantum Dot Silicon Nitride Waveguide Gain Measurement Based on Variable Stripe Length Method, Yunpeng Zhu[1], Weiqiang Xie[1], Pieter Geiregat[1], Suzanne Bisschop[1], Tangi Aubert[1], Edouard Brainis[1], Zeger Hens[1], Dries v. Thourhout[1], [1]*Ghent Univ., Belgium.* We fabricated hybrid colloidal quantum dot silicon nitride waveguides and demonstrate they exhibit amplified spontaneous emission under femtosecond optical pumping. The gain coefficient is measured using an integrated variable stripe length method.

ATh1J.6 • 09:30
On-chip Generation of Infrared Orbital Angular Momentum Beams using a Dielectric Metamaterial, Rolf Szedlak[1], Thomas Hisch[4], Martin Holzbauer[2], Donald MacFarland[1], Tobias Zederbauer[2], Hermann Detz[3], Aaron Maxwell Andrews[1], Werner Schrenk[2], Stefan Rotter[4], Gottfried Strasser[1,2], [1]*Inst. of Solid State Electronics, TU Wien, Austria;* [2]*Center for Micro- and Nanostructures, TU Wien, Austria;* [3]*Austrian Academy of Sciences, Austria;* [4]*Inst. for Theoretical Physics, TU Wien, Austria.* We present a compact laser source emitting orbital angular momentum beams created by an on-chip gradient-index metamaterial. In combination with the tailorable wavelength of our emitter this enables on-demand applications in a variety of fields.

ATh1J.7 • 09:45
Mid-Infrared Broadband Absorber of Full Semiconductor Epi-Layers, Shaohua Wang[1,2], Yu'ei Wang[2], Singuleng Zhang[1,2], Wan-hua Zheng[1,2], [1]*State Key Lab on Integrated Optoelectronics, Inst. of Semiconductors, CAS, China,* [2]*Lab of Solid State Optoelectronics Information Technology, Inst. of Semiconductors, CAS, China.* We demonstrate a mid-infrared broadband absorber of full semiconductor epi-layers theoretically. The structure is of MIM-like with grating InAs(n-type,220nm)/InAs(i,220nm)/InAs(n-type,1000nm). The absorptivity is over 80% from 8 μm to 12 μm.

ATh1K • Advanced Technology for Industrial Processing—Continued

ATh1K.5 • 09:15
An Oriented-Dependence-Microlens Visually Aligned and Packaged for Lasers to Polarization Maintaining Fibers, Liu Chun-Nien[1], Wen-Hsuan Hsieh[2], Ying-Chien Tsai[2], Yi-Cheng Hsu[2], Che-Hsin Lin[3], Wood-Hi Cheng[1], [1]*Graduate Inst. of Optoelectronic Engineering, National Chung Hsing Univ., Taiwan;* [2]*Dept. of Photonics, National Sun Yat-Sen Univ., Taiwan;* [3]*Dept. of Mechanical Engineering, Cheng-Shiu Univ., Taiwan,* [4]*Dept. of Biomechatronics Engineering, National Pingtung Univ. of Science and Technology , Taiwan,* [5]*Dept. of Mechanical and Electromechanical, National Sun Yat-sen Univ., Taiwan.* A new scheme of oriented-dependence-microlens (ODM) for lasers coupling to polarization-maintaining-fibers is demonstrated. Results showed that the ODMs enabled to visually passive alignment and packaging to achieve 80% coupling efficiency and 30-dB polarized extinction ratio.

ATh1K.6 • 09:30
Terahertz pulsed spectroscopy of medium polymerization, Egor Yakovlev[1], Kirill Zaytsev[1,2], Arsenii A. Gavdush[1], Stanislav Yurchenko[1,2], [1]*Bauman Moscow State Technical Univ., Russia;* [2]*I.M.Sechenov First Moscow State Medical Univ., Russia.* An ability to sense the medium polymerization using terahertz spectroscopy has been demonstrated. Terahertz material parameters of epoxy have been measured during its polymerization. Significant changes of the material parameters have been observed.

ATh1K.7 • 09:45
Adhesion mechanism between laser sputtered Aluminum nano particles on Si-Wafer by Nd:YAG laser, Mohammad Hossein Azhdast[1], Hans Joachim Eichler[2], Klaus D. Lang[3], Veronika Glaw[3], [1]*PacTech & TU-Berlin, Germany,* [2]*Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration IZM, Germany;* [3]*TU-Berlin, Germany.* In this research, different laser parameters is investigated using Nd:YAG Picosecond laser to sputter nano particles on Si-Wafer substrate. The influence of various parameters on adhesion tests and mechanism of deposited layer is studied.

CLEO: Science & Innovations

STh1L • Large Bandgap and Hybrid Lasers—Continued

STh1L.3 • 09:15
Tunable High-Power Narrow-Linewidth Green External-Cavity Gan Diode Laser, Mingjun Chi[1], Ole B. Jensen[1], Paul M. Petersen[1], [1]*DTU Fotonik, Danmarks Tekniske Universitet, Denmark.* A tunable high-power green external-cavity diode laser is demonstrated. Up to 290 mW output power and a 9.2 nm tuning is achieve. This constitutes the highest output power from a tunable green diode laser system.

STh1L.4 • 09:30
A Tunable Hybrid Laser With Ultra-High Tuning Efficiency, Di Liang[1], Xue Huang[1], Geza Kurczveil[1], Marco Fiorentino[1], Ray Beausoleil[1], [1]*Hewlett Packard Labs, USA.* We demonstrate a novel hybrid microring laser with an integrated III-V-on-Si metal-oxide-semiconductor (MOS) capacitor for essentially zero-power tuning in wavelength and output power. Over 10,000,000X better tuning efficiency and chirp-free operation have been achieved.

STh1L.5 • 09:45
Integration of III-V Nanopillar Resonator to In-Plane Silicon Waveguides, Gilliard N. Malheiros-Silveira[1], Fanglu Lu[1], Indrasen Bhattacharya[1], Thai-Truong D. Tran[1], Hao Sun[1], Connie J. Chang-Hasnain[1], [1]*Dept. of Electrical Engineering and Computer Sciences, Univ. of California, USA.* We proposed, fabricated, and characterized new structures based on III-V compound semi-conductor nanopillars, monolithically integrated to silicon platform, for coupling spontaneous and stimulated emission to silicon waveguides.

10:00-13:00 Technology Transfer Program, *Exhibit Hall 2*

10:00–15:00 Exhibition Open, *Exhibit Halls 1, 2, & 3*

10:00–14:00 Coffee Break (10:00-10:30) and Unopposed Exhibit Only Time, *Exhibit Halls 1, 2, & 3*