



Österreichische
Physikalische
Gesellschaft



Gemeinsame Jahrestagung in Innsbruck 30. August - 3. September 2021

Universität Innsbruck, Technik Campus

Joint Annual Meeting in Innsbruck 30 August - 3 September 2021

Programmübersicht Program Overview



in Zusammenarbeit mit - in collaboration with



179	<p style="text-align: center;">Modelling, fabrication and characterization of low-density polyethylene based plasmonic waveguides for mid-IR photonic networks</p> <p style="text-align: center;"><i>Hanh Hoang¹, Mauro David¹, Davide Disnà², Ismail Doganlar¹, Hermann Detz³, Ulrich Schmid², Gottfried Strasser¹, Borislav Hinkov¹</i></p> <p style="text-align: center;">¹ Institute of Solid State Electronics and Center for Micro- and Nanostructures, TU Wien ² Institute of Sensor and Actuator Systems, TU Wien ³ Brno University of Technology</p> <p>In this work we present the realization of low-density polyethylene (LDPE) ridge-waveguides using spinning-deposition, standard-lithography and oxygen-plasma-etching for patterning. Parameters such as toluene-solvent concentration, spinning-speed and bake-out-process temperature in a vacuum-oven are optimized in order to obtain the required film-thickness. Ellipsometry data shows a LDPE-thickness of ~ 400 - 500 nm, corresponding to refractive index of 1.51 (at 630 nm). The results indicate that spin-coating with bake-out at 100°C yields the best-quality LDPE-films. Additional COMSOL simulations display low optical losses of LDPE for the whole mid-IR spectral range. As proof-of-concept we will also present the results of optical characterization performed in the log-wave infrared to confirm the suitability of LDPE for mid-IR plasmonic applications.</p>
180	<p style="text-align: center;">Continuous-Wave Ring Interband Cascade Lasers for Spectroscopic Sensing</p> <p style="text-align: center;"><i>Rolf Szedlak¹, Hedwig Knötig¹, Borislav Hinkov¹, Robert Weih², Sven Höfling³, Werner Schrenk¹, Johannes Koeth², Johannes Paul Waclawek¹, Bernhard Lendl¹, Gottfried Strasser¹</i></p> <p style="text-align: center;">¹ TU Wien, ² nanoplus Nanosystems and Technologies GmbH, ³ University of Würzburg</p> <p>Infrared spectroscopy is a reliable tool for chemical sensing in various fields from industry over environmental monitoring to medicine. Interband cascade lasers (ICLs) have proven to be important light sources for such applications. Utilization of ring-shaped laser geometries provides a collimated beam profile as well as vertical light emission. We combine the ring geometry with the ICL technology and present the first continuous-wave ring ICL. The laser provides single-mode emission at 4.4 μm, which makes it an ideal candidate for various spectroscopic applications. In addition, the relatively low power consumption of ICLs facilitates lightweight sensors for hand-held devices.</p>
181	<p style="text-align: center;">Engineering the spectral bandwidth of quantum cascade laser frequency combs</p> <p style="text-align: center;"><i>Maximilian Beiser¹, Nikola Opačak¹, Benedikt Schwarz¹, Johannes Hillbrand², Gottfried Strasser¹</i></p> <p style="text-align: center;">¹ Institute of Solid State Electronics, TU Wien, ² ETH Zürich</p> <p>Quantum cascade lasers facilitate compact optical frequency comb sources that operate in the mid-infrared. Enhancing the optical bandwidth of these chip-sized lasers is important to address their application in broadband high-precision spectroscopy. We provide an investigation of the comb spectral width and show how it can be optimized to obtain its maximum value. The interplay of nonoptimal values of the resonant Kerr nonlinearity and the cavity dispersion can lead to significant narrowing of the comb spectrum. The implementation of high losses is shown to be favourable and finally injection locking of QCLs around the roundtrip frequency provides a stable knob to control the FM state and recover the maximum width.</p>
182	<p style="text-align: center;">Femtosecond pulses from a mid-infrared quantum cascade laser</p> <p style="text-align: center;"><i>Philipp Täschler, Mathieu Bertrand, Barbara Schneider, Matthias Beck, Jérôme Faist, Pierre Jouy, Matthew Singleton, ETH Zürich</i></p> <p>The quantum cascade laser has evolved to be a compact, powerful source of coherent mid-infrared light. However, its fast gain dynamics strongly restricts the formation of ultrashort pulses. As such, the shortest pulses reported so far were limited to a few picoseconds with some hundreds of milliwatts of peak power, strongly narrowing their applicability for time-resolved and nonlinear experiments. Here, we demonstrate an approach capable of producing near-transform-limited sub-picosecond pulses with several watts of peak power. Starting from a frequency modulated phase-locked state, ultrashort pulses are generated via external pulse compression. We assess their temporal nature by means of a novel optical sampling method, coherent beatnote interferometry and interferometric autocorrelation.</p>

Joint Annual Meeting in Innsbruck 2021

Postersession: Tuesday 31.08. + Thursday 02.09.

Postersession: Tue: 19:00 - 20:30 ; Thu: 13:00 - 14:30 It is expected that ALL posters are on display on both days !		
KOND	FAKT - TASK	Quantum Information and Quantum Computing
171 Anastasiia Skurativska	3001 Simone Gargiulo	561 Christian Schimpf
172 Paolo Usai	3002 Cornelis Doorenbos	562 Laurin Fischer
173 Ka Rin Sim	3003 Alina Weiser	563 Andreas Klingler
174 Duc Phan	3004 Manuel Zeyen	564 <i>cancelled</i>
175 Maurizio E. Musso	3005 Johannes Gruber	565 <i>cancelled</i>
176 Benoit Truc	3006 Alexander Ebenbichler	566 Eleftherios-Ermis Tselentis
177 Ismail Cem Doganlar	3007 <i>cancelled</i>	567 Martin Zemlicka
178 Marie Ertl	3008 Wolfgang Wieland	568 David Gunn
179 Hanh Hoang		569 Cornelia Spee
180 Rolf Szedlak		570 Nicky Li
181 Maximilian Beiser		571 Tristan Kraft
182 Philipp Täschler	Atomic Physics and Quantum Optics	572 Martin Johannes Renner
183 Dominik Theiner	451 Christine M. Lochmann	573 Aleksei Sharafiev
184 Paolo Micheletti	452 Arnab Khan	574 Giovanni Cerchiari
185 Michael Jaidl	453 Sruthi Purushu Melath	575 Matthias Bock
186 Michael Denner	454 Verena Scheil	
187 Albert Gasull	455 Fatemeh Bibak	
188 Lukas Hellbrück	456 Gregor Anich	Applied Physics & Plasma Physics
189 Abhishek Kumar	457 <i>Charly Beulenkamp</i>	631 Franziska Dahlmann
190 Barbora Budinská	458 Mikolaj Franciszek Roguski	632 Paul Hiet
191 Sebastian Lamb-Camarena	459 Philipp Rieser	633 Franz Ferdinand Locker
192 Markus Kratzer	460 Constanze Bach	634 Pradeep S. Balasubramanian
193 Wisnu Ananda	461 Klemens Winkler	635 Guillermo W. Zarate Segura
194 Florian Ellinger	462 Arpita Das	636 Andreas Lanz
	463 Volkhard Maeckel	637 Atilay Ayasli
	464 Lucas de Sousa Borges	638 Shan Jin
	465 Sebastian Wald	639 Maximilian Münt
	466 Fritz Diorico	640 Manuel Rainer
Surfaces, Interfaces and Thin Films	467 Dominik Winter	641 Roman Schrittwieser
251 Maja Vasiljevic	468 Pere Rosselló	642 <i>Salvi Mohandas</i>
252 Nikolaus Rauch	469 Rui Lin	
253 Julia Lanz	470 Yannick Weiser	
254 Aleksander Brozyniak	471 Giovanni Cerchiari	
255 Miltscho Andreev	472 Vyacheslav Li	Biophysics, Medical Physics and Soft Matter
256 Michael Brunthaler	473 Lukas Deeg	721 Henrik Siboni
257 Paul Ryan	474 Elham Ghavidel	722 Franziska Strasser
258 Florian Dörr		723 Elisabeth Gruber
259 Aji Alexander		724 Simon Moser
260 Zbynek Novotny		725 Maurizio E. Musso
261 Tomáš Dolák		726 Simone Schirra
262 Muhammad Awais Aslam		727 Veronica Leccese
263 Bernd Michael Stechauner		
264 Kari Martinez		

30.08.2021