



Benedikt Schwarz

Dipl.-Ing. Dr.techn.

Personal information

Telephone +43 (1) 58801 362 27 (work)
E-mail benedikt.schwarz@tuwien.ac.at
Nationality Austria, European Union

Academic career

- 5/2016 – **Principal investigator**, *TU Wien*, Vienna, Austria.
present Institute of Solid State Electronics, Vienna, Austria
project Nanoplasmonics in the mid-infrared (FWF P28914-N27, 352k€)
description Research on plasmonic effects and nano-plasmonic devices for future integrated photonics.
- 6/2016 **Visiting researcher**, *Harvard University*, Cambridge, Massachusetts, USA.
group Prof. Federico Capasso
topic Frequency combs
- 1/2016 – **Postdoctoral researcher**, *TU Wien*, Vienna, Austria.
4/2016 Institute of Solid State Electronics, Vienna, Austria
- 3–6/2015 **Visiting researcher**, *Harvard University*, Cambridge, Massachusetts, USA.
Fellow of School of Engineering and Applied Sciences
group Prof. Federico Capasso
topics Nonlinearities, multi-mode operation and saturation effects in quantum cascade lasers
- 12/2011– **Project assistant**, *TU Wien*, Vienna, Austria.
12/2015 Institute of Solid State Electronics
group Prof. Gottfried Strasser
topic PhD thesis: Monolithic integration of mid-infrared photonics
- 7–11/2011 **Research assistant**, *TU Wien*, Vienna, Austria.
Institute of Microelectronics
supervisor Prof. Tibor Grasser
topic Development of advanced simulation tools to investigate reliability issues of modern CMOS devices

Education

- 11/2011– **PhD in technical Sciences** (with honors), *TU Wien*, Vienna, Austria.
12/2015 Institute of Solid State Electronics
thesis Monolithic integration of mid-infrared photonics
supervisor Prof. Gottfried Strasser
description A quantum cascade laser was combined with detection functionality to enable the emission and detection on the same chip. Together with a plasmonic waveguide the first monolithically integrated sensor based on mid-infrared absorption spectroscopy was realized.
- 10/2007– **Dipl.Ing./MSc in Microelectronics** (with honors) , *TU Wien*, Vienna, Austria.
6/2011 BSc in Electrical Engineering and Information Technology
duration 8 semester including BSc (nominally 10, average 13–14)
master thesis Simulation of random dopant fluctuations with a quantum corrected drift diffusion model
bachelor thes. *Numeric improvements of SPICE for non-linear distortion analysis*
supervisor Prof. Tibor Grasser
- 2001–2006 **Matura (equiv. A-level)**, *Secondary Technical College of Electronics and Telecommunication*, Innsbruck, Austria.
thesis *Realization of an automated radioactivity monitoring device for remote areas*

Professional Experience

- 2012-present **Technical consulting**, *Dipl. Ing. Franz Schwarz EG*, (Steinfeld 10/2, 6068 Mils bei Innsbruck, Austria).
Electromagnetic and structural analysis as well as computational visualization of power-lines
- 2004–2010 **Employee**, *Dipl. Ing. Franz Schwarz EG*, (Steinfeld 10/2, 6068 Mils bei Innsbruck, Austria).
Software development, system administration, web-page development, advertisement
- 2004–2010 **Holiday job**, *Seefeld Ski School*, (Münchner Str. 142, 6100 Seefeld, Austria).
Ski and snowboard instructor
- 8/2003, **Internship/Employee**, *DI Bernard Zösmayr GesmbH*, (Höttinger Gasse 12, 6020 Innsbruck, Austria).
8/2005,
5-6/2006 Electrical installation and planning
- 8/2004 **Internship**, *EVN AG*, *producer and transporter of electricity*, (EVN Platz, 2344 Maria Enzersdorf, Austria).
CAD drawing, surveying and mapping

Awards and Scholarships

- 2016 **INITs Award**, for scientific achievements with high potential for commercial application from the business incubator INITs, Vienna, Austria.
- 2016 **Photonics21 Student Innovation Award**, for outstanding photonics research on "Miniaturized mid-infrared sensors" from the European technology platform Photonics21, Brussels, Belgium.

- 2013 **Best Paper Award IRPS 2012**, for the publication B. Kaczer et al. "The Relevance of Deeply-Scaled FET Threshold Voltage Shifts for Operation Lifetimes".
- 2012 **Förderungsstipendium**, Scholarship of the Faculty of Electrical Engineering and Information Technology, TU Wien.
- 2011 **Würdigungspreis des BMWF**, High honors from the Austrian Federal Ministry of Science and Research for an outstanding graduation.
- 2008, 2009, 2010, 2011 **Leistungsstipendium**, Scholarships for Excellence from the Faculty of Electrical Engineering and Information Technology, TU Wien.

Personal skills and competences

Languages

- German (mother tongue)
- English (business fluent)

Teaching

- Exercises in solid state physics
- Exercises in programming
- Exercises in analog integrated circuit design

Programming

- C, C++, Python, Java, Unix-Shell
- Numerical mathematics
- 3D visualization (vtk,osg)
- Embedded systems

IT and software

- Comsol, Matlab, Octave, AutoCad, Solidworks, Altium designer, Spice
- Linux, Windows, Open/Libre and Microsoft Office, Latex

Social skills and competences

- Creative/Innovative
- Positive Attitude
- Problem-Solving Skills
- Communication/Teamwork
- Strong Work Ethic
- Motivational Skills

Private interests

- Sports Road- and mountain-biking, skiing, snowboarding, hiking, climbing (UIAA 8), slack-lining, volleyball, ballroom dancing
- Music Piano playing (jazz, classical and pop)

Research interest and activity

Optoelectronics, mid-infrared photonics, intersubband laser and detectors, plasmonics, integrated photonics, microelectronics, numerical simulation and modeling

21 peer-reviewed publications, h-index of 10 and 247 citations (Google Scholar, Mai 2017)

39 oral presentations (12 invited) at international Conferences

2 invited seminar presentations

Reviewer for Analyst, Applied Physics Letters, Optics Express, Superlattices and Microstructures

5 selected publications

- [1] B. Schwarz, P. Reininger, D. Ristanić, H. Detz, A. M. Andrews, W. Schrenk, and G. Strasser. “Monolithically integrated mid-infrared lab-on-a-chip using plasmonics and quantum cascade structures”. *Nature Communications* **5**, 4085 (2014). doi: 10.1038/ncomms5085.
- [2] T. S. Mansuripur, C. Vernet, P. Chevalier, G. Aoust, B. Schwarz, F. Xie, C. Caneau, K. Lascola, C. en Zah, D. P. Caffey, T. Day, L. J. Missaggia, M. K. Connors, C. A. Wang, A. Belyanin, and F. Capasso. “Single-mode instability in standing-wave lasers: The quantum cascade laser as a self-pumped parametric oscillator”. *Physical Review A* **94**, 6 (2016). doi: 10.1103/physreva.94.063807.
- [3] C. Wang, B. Schwarz, D. Siriani, M. Connors, L. Missaggia, D. Calawa, D. McNulty, A. Akey, M. Zheng, J. Donnelly, T. Mansuripur, and F. Capasso. “Sensitivity of heterointerfaces on emission wavelength of quantum cascade lasers”. *Journal of Crystal Growth*, (2016). doi: 10.1016/j.jcrysgro.2016.11.029.
- [4] S. Schuler, D. Schall, D. Neumaier, L. Dobusch, O. Bethge, B. Schwarz, M. Krall, and T. Mueller. “Controlled Generation of a p-n Junction in a Waveguide Integrated Graphene Photodetector”. *Nano Letters* **16** (2016) pp. 7107–7112. doi: 10.1021/acs.nanolett.6b03374.
- [5] B. Kaczer, J. Franco, M. Toledano-Luque, P. Roussel, M. F. Bukhori, A. Asenov, B. Schwarz, M. Bina, T. Grassler, and G. Groeseneken. “The relevance of deeply-scaled FET threshold voltage shifts for operation lifetimes”. *Proceedings of International Reliability Physics Symposium (IRPS 2012)*. IEEE. 2012 5A–2. doi: 10.1109/IRPS.2012.6241839.

Peer-reviewed publications

- [1] B. Schwarz, C. A. Wang, L. Missaggia, T. S. Mansuripur, P. Chevalier, M. K. Connors, D. McNulty, J. Cederberg, G. Strasser, and F. Capasso. “Watt-Level Continuous-Wave Emission from a Bifunctional Quantum Cascade Laser/Detector”. *ACS Photonics*, (2017). doi: 10.1021/acsphotonics.7b00133.
- [2] C. A. Wang, B. Schwarz, D. F. Siriani, L. J. Missaggia, M. K. Connors, T. S. Mansuripur, D. R. Calawa, D. McNulty, M. Nickerson, J. P. Donnelly, K. Creedon, and F. Capasso. “MOVPE Growth of LWIR AlInAs/GaInAs/InP Quantum Cascade Lasers: Impact of Growth and Material Quality on Laser Performance”. *IEEE Journal of Selected Topics in Quantum Electronics* (2017) pp. 1–1. doi: 10.1109/jstqe.2017.2677899.
- [3] S. Schuler, D. Schall, D. Neumaier, L. Dobusch, O. Bethge, B. Schwarz, M. Krall, and T. Mueller. “Controlled Generation of a p-n Junction in a Waveguide Integrated Graphene Photodetector”. *Nano Letters* **16** (2016) pp. 7107–7112. doi: 10.1021/acs.nanolett.6b03374.
- [4] T. S. Mansuripur, C. Vernet, P. Chevalier, G. Aoust, B. Schwarz, F. Xie, C. Caneau, K. Lascola, C. en Zah, D. P. Caffey, T. Day, L. J. Missaggia, M. K. Connors, C. A. Wang, A. Belyanin, and F. Capasso. “Single-mode instability in standing-wave lasers: The quantum cascade laser as a self-pumped parametric oscillator”. *Physical Review A* **94**, 6 (2016). doi: 10.1103/physreva.94.063807.
- [5] C. Wang, B. Schwarz, D. Siriani, M. Connors, L. Missaggia, D. Calawa, D. McNulty, A. Akey, M. Zheng, J. Donnelly, T. Mansuripur, and F. Capasso. “Sensitivity of heterointerfaces on emission wavelength of quantum cascade lasers”. *Journal of Crystal Growth*, (2016). doi: 10.1016/j.jcrysgro.2016.11.029.
- [6] R. Szedlak, A. Harrer, M. Holzbauer, B. Schwarz, J. P. Wacławek, D. MacFarland, T. Zederbauer, H. Detz, A. M. Andrews, W. Schrenk, B. Lendl, and G. Strasser. “Remote Sensing with Commutable Monolithic Laser and Detector”. *ACS Photonics* **3** (2016) 1794–1798. doi: 10.1021/acsphotonics.6b00603.

- [7] A. Harrer, B. Schwarz, S. Schuler, P. Reininger, A. Wirthmüller, H. Detz, D. MacFarland, T. Zederbauer, A. M. Andrews, M. Rothermund, H. Oppermann, W. Schrenk, and G. Strasser. "4.3 quantum cascade detector in pixel configuration". *Optics Express* **24** (2016) p. 17041. doi: 10.1364/oe.24.017041.
- [8] A. Harrer, R. Szedlak, B. Schwarz, H. Moser, T. Zederbauer, D. MacFarland, H. Detz, A. M. Andrews, W. Schrenk, B. Lendl, and G. Strasser. "Mid-infrared surface transmitting and detecting quantum cascade device for gas-sensing". *Scientific Reports* **6** (2016) p. 21795. doi: 10.1038/srep21795.
- [9] P. Reininger, T. Zederbauer, B. Schwarz, H. Detz, D. MacFarland, A. M. Andrews, W. Schrenk, and G. Strasser. "InAs/AlAsSb based quantum cascade detector". *Applied Physics Letters* **107** (2015) p. 081107. doi: 10.1063/1.4929501.
- [10] B. Schwarz, D. Ristanic, P. Reininger, T. Zederbauer, D. MacFarland, H. Detz, A. M. Andrews, W. Schrenk, and G. Strasser. "High performance bi-functional quantum cascade laser and detector". *Applied Physics Letters* **107** (2015) p. 071104. doi: 10.1063/1.4927851.
- [11] **(invited)** P. Reininger, B. Schwarz, R. Gansch, H. Detz, D. MacFarland, T. Zederbauer, A. M. Andrews, W. Schrenk, and G. Strasser. "Quantum cascade detector utilizing the diagonal-transition scheme for high quality cavities". *Optics Express* **23** (2015) p. 6283. doi: 10.1364/oe.23.006283.
- [12] D. Ristanic, B. Schwarz, P. Reininger, H. Detz, T. Zederbauer, A. M. Andrews, W. Schrenk, and G. Strasser. "Monolithically integrated mid-infrared sensor using narrow mode operation and temperature feedback". *Applied Physics Letters* **106** (2015) p. 041101. doi: 10.1063/1.4906802.
- [13] A. Harrer, B. Schwarz, R. Gansch, P. Reininger, H. Detz, T. Zederbauer, A. M. Andrews, W. Schrenk, and G. Strasser. "Plasmonic lens enhanced mid-infrared quantum cascade detector". *Applied Physics Letters* **105** (2014) p. 171112. doi: 10.1063/1.4901043.
- [14] P. Reininger, B. Schwarz, H. Detz, D. MacFarland, T. Zederbauer, A. M. Andrews, W. Schrenk, O. Baumgartner, H. Kosina, and G. Strasser. "Diagonal-transition quantum cascade detector". *Applied Physics Letters* **105** (2014) p. 091108. doi: 10.1063/1.4894767.
- [15] B. Schwarz, P. Reininger, D. Ristanic, H. Detz, A. M. Andrews, W. Schrenk, and G. Strasser. "Monolithically integrated mid-infrared lab-on-a-chip using plasmonics and quantum cascade structures". *Nature Communications* **5**, 4085 (2014). doi: 10.1038/ncomms5085.
- [16] P. Reininger, B. Schwarz, A. Harrer, T. Zederbauer, H. Detz, A. M. Andrews, R. Gansch, W. Schrenk, and G. Strasser. "Photonic crystal slab quantum cascade detector". *Applied Physics Letters* **103** (2013) p. 241103. doi: 10.1063/1.4846035.
- [17] B. Schwarz, P. Reininger, H. Detz, T. Zederbauer, A. Andrews, W. Schrenk, and G. Strasser. "Monolithically Integrated Mid-Infrared Quantum Cascade Laser and Detector". *Sensors* **13** (2013) pp. 2196–2205. doi: 10.3390/s130202196.
- [18] B. Schwarz, P. Reininger, H. Detz, T. Zederbauer, A. M. Andrews, S. Kalchmair, W. Schrenk, O. Baumgartner, H. Kosina, and G. Strasser. "A bi-functional quantum cascade device for same-frequency lasing and detection". *Applied Physics Letters* **101** (2012) p. 191109. doi: 10.1063/1.4767128.
- [19] J. Franco, B. Kaczer, M. Toledano-Luque, P. Roussel, G. Groeseneken, B. Schwarz, M. Bina, M. Waltl, P.-J. Wagner, and T. Grasser. "Reduction of the BTI Time-Dependent Variability in Nanoscaled MOSFETs by Body Bias". *Proceedings of International Reliability Physics Symposium (IRPS 2013)*. IEEE. 2013 p. 2D.3. doi: 10.1109/IRPS.2013.6531958.
- [20] M. Bina, O. Triebel, B. Schwarz, M. Karner, B. Kaczer, and T. Grasser. "Simulation of Reliability on Nanoscale Devices". *Proceedings of the 17th International Conference on Simulation of Semiconductor Processes and Devices (SISPAD 2012)*. IEEE. 2012 pp. 109–112. web link.

- [21] B. Kaczer, J. Franco, M. Toledano-Luque, P. Roussel, M. F. Bukhori, A. Asenov, B. Schwarz, M. Bina, T. Grasser, and G. Groeseneken. "The relevance of deeply-scaled FET threshold voltage shifts for operation lifetimes". *Proceedings of International Reliability Physics Symposium (IRPS 2012)*. IEEE. 2012 5A–2. doi: 10.1109/IRPS.2012.6241839.

Other publications

- [1] B. Schwarz, P. Reininger, H. Detz, and G. Strasser. "Integrierte Flüssigkeitssensoren für Vor-Ort-Analysen". *Labor Praxis, reprint Special Issue: Mikro Fluidik*, (August 2014 and Mai 2015). web link.

Invited seminar presentation

- [1] B. Schwarz. "Quantum cascade laser/detectors and plasmonics for mid-infrared integrated photonics". *Seminar at RWTH Aachen University*. Aachen, Germany. 2016.
- [2] B. Schwarz. "Monolithic integration of mid-infrared photonics". Massachusetts Institute of Technology, Lincoln Laboratory, USA; 2015-04-29. Massachusetts, USA. 2015.

Oral conference presentation

- [1] **(invited)** B. Schwarz. "QCL technology for future applications: From on-chip detection to frequency comb generation". 25th Int. Symp. "Nanostructures: Physics and Technology", Saint Petersburg; 2017-06-36 – 2017-06-30. 2017.
- [2] B. Schwarz, C. A. Wang, T. S. Mansuripur, M. K. Connors, D. McNulty, G. Strasser, and F. Capasso. "Continuous-wave operation of MOVPE grown bi-functional quantum cascade laser/detectors". SPIE Photonics West 2017, San Francisco; 2017-01-28 – 2017-02-02. 2017.
- [3] B. Schwarz, D. Ristanic, P. Reininger, H. Detz, A. M. Andrews, W. Schrenk, and G. Strasser. "Plasmonics for mid-infrared on-chip sensing". Nanometa 2016, Seefeld; 2017-01-04 – 2017-01-07. 2017.
- [4] **(invited)** B. Schwarz, D. Ristanic, P. Reininger, W. Schrenk, H. Detz, T. Zederbauer, A. M. Andrews, D. MacFarland, and G. Strasser. "QCL based liquid sensing 2.0: A single chip solution". SCIX 2016, Minneapolis; 2016-09-18 – 2016-09-23. 2016.
- [5] **(invited)** B. Schwarz, B. Hinkov, D. Ristanic, P. Reininger, H. Detz, A. M. Andrews, W. Schrenk, and G. Strasser. "A monolithically integrated mid-infrared lab-on-a-chip". International Conference on Nano Engineering, MNE 2016, Vienna; 2016-09-19 – 2016-09-23. 2016.
- [6] **(invited)** G. Strasser, B. Schwarz, R. Szedlak, A. Harrer, H. Detz, A. M. Andrews, T. Zederbauer, D. MacFarland, and W. Schrenk. "Quantum cascade detectors and monolithically integrated sensing devices". FLAIR 2016, Aix-les-Bains; 2016-09-12 – 2016-09-16. 2016.
- [7] **(invited)** P. Reininger, T. Zederbauer, B. Schwarz, H. Detz, D. MacFarland, A. M. Andrews, W. Schrenk, and G. Strasser. "A low effective mass material system for quantum cascade detectors". SPIE Photonics West, San Francisco; 2016-02-13 – 2016-02-18. 2016.
- [8] **(invited)** A. Harrer, B. Schwarz, R. Szedlak, D. Ristanic, H. Detz, A. M. Andrews, T. Zederbauer, D. MacFarland, W. Schrenk, and G. Strasser. "Quantum Cascade devices: from discrete to integrated systems". 13th International Conference on Mid-IR Optoelectronics, Beijing; 2016-09-18 – 2016-09-22. 2016.
- [9] **(invited)** R. Szedlak, A. Harrer, B. Schwarz, M. Holzbauer, J. P. Wacławek, D. MacFarland, T. Zederbauer, H. Detz, A. M. Andrews, W. Schrenk, B. Lendl, and G. Strasser. "Remote gas sensing with commutable quantum cascade laser and detector on the same Chip". International Quantum Cascade Lasers School and Workshop (IQCLSW 2016), Cambridge; 2016-09-04 – 2016-09-09. 2016.

- [10] **(invited)** R. Szedlak, A. Harrer, M. Holzbauer, B. Schwarz, J. P. Wacławek, H. Moser, D. MacFarland, T. Zederbauer, H. Detz, A. M. Andrews, W. Schrenk, B. Lendl, and G. Strasser. "Compact mid-IR sensors based on bi-functional and commutable semiconductor lasers and detectors on the same chip". International WORKshop on Infrared Technologies, Olching; 2016-11-07 – 2016-11-08. 2016.
- [11] B. Schwarz, D. Ristanic, P. Reininger, H. Detz, A. M. Andrews, W. Schrenk, and G. Strasser. "Plasmonic waveguide based mid-infrared lab-on-a-chip". META'16 - International Conference on Metamaterials, Photonic Crystals and Plasmonics, Malaga; 2016-07-25 – 2016-07-28. 2016.
- [12] T. S. Mansuripur, C. Vernet, G. Aoust, B. Schwarz, Y. Wang, A. A. Belyanin, and F. Capasso. "Single-mode to multimode transition in quantum cascade lasers caused by the dynamic Stark effect". SPIE Photonics West, San Francisco; 2016-02-13 – 2016-02-18. 2016.
- [13] A. Harrer, B. Schwarz, P. Reininger, R. Szedlak, T. Zederbauer, H. Detz, D. MacFarland, A. M. Andrews, W. Schrenk, and G. Strasser. "An optimized bi-functional material for integrated mid-infrared quantum cascade based sensors". SPIE Photonics West, San Francisco; 2016-02-13 – 2016-02-18. 2016.
- [14] R. Szedlak, A. Harrer, B. Schwarz, M. Holzbauer, H. Moser, D. MacFarland, T. Zederbauer, H. Detz, A. M. Andrews, W. Schrenk, B. Lendl, and G. Strasser. "Highly Integrated Gas Sensors based on Bi-functional Quantum Cascade Structures". CLEO 2016, San Jose; 2016-06-05 – 2016-06-10. 2016.
- [15] A. Harrer, R. Szedlak, B. Schwarz, H. Moser, T. Zederbauer, D. MacFarland, H. Detz, A. M. Andrews, B. Lendl, and G. Strasser. "Mid-infrared bi-functional quantum cascade sensor for long interaction regions". International Conference Functional Integrated nano Systems, Graz; 2016-06-27 – 2016-06-29. 2016.
- [16] R. Szedlak, A. Harrer, M. Holzbauer, B. Schwarz, D. MacFarland, T. Zederbauer, H. Detz, A. M. Andrews, W. Schrenk, and G. Strasser. "Mid-infrared ring lasers for sensing applications". EUROPHOTON 2016, Wien; 2016-08-21 – 2016-08-26. 2016.
- [17] **(invited)** W. Schrenk, R. Szedlak, D. Ristanic, B. Schwarz, P. Reininger, A. Harrer, H. Detz, D. C. MacFarland, A. M. Andrews, and G. Strasser. "Integrated Ring Laser Systems for Spectroscopy based on Quantum Cascade Structures". SciX, Providence, RI, USA ; 2015-09-27 – 2015-10-2. 2015.
- [18] **(invited)** G. Strasser, D. Ristanic, B. Schwarz, P. Reininger, H. Detz, A. M. Andrews, T. Zederbauer, D. MacFarland, and W. Schrenk. "A Mid-Infrared On-Chip Sensor Array Based on Bi-functional Quantum Cascade Structures and Plasmonics". ICAVS8, Wien; 2015-07-12 – 2015-07-17. 2015.
- [19] B. Schwarz, A. Harrer, D. Ristanic, P. Reininger, H. Detz, T. Zederbauer, A. M. Andrews, W. Schrenk, and G. Strasser. "Bi-functional quantum cascade laser/detectors: From design to applications". International Conference on Intersubband Transitions in Quantum Wells (ITQW), Vienna, Austria; 2015-09-06 – 2015-09-11. 2015.
- [20] P. Reininger, T. Zederbauer, B. Schwarz, H. Detz, D. MacFarland, A. M. Andrews, W. Schrenk, and G. Strasser. "InAs/AlAsSb for quantum cascade detectors". International Conference on Intersubband Transitions in Quantum Wells (ITQW), Vienna, Austria; 2015-09-06 – 2015-09-11. 2015.
- [21] A. Harrer, B. Schwarz, R. Szedlak, J. P. Wacławek, H. Moser, D. MacFarland, T. Zederbauer, H. Detz, A. M. Andrews, W. Schrenk, B. Lendl, and G. Strasser. "A bi-functional surface emitting and detecting mid-infrared device for sensing applications". ÖPG-Jahrestagung, Wien; 2015-09-01 – 2015-09-04. 2015.
- [22] A. Harrer, P. Reininger, R. Gansch, B. Schwarz, D. MacFarland, T. Zederbauer, H. Detz, A. M. Andrews, W. Schrenk, O. Baumgartner, H. Kosina, and G. Strasser. "Quantum Cascade Detectors for Sensing Applications". ICAVS8, Wien; 2015-07-12 – 2015-07-17. 2015.

- [23] A. Harrer, R. Szedlak, M. Holzbauer, B. Schwarz, H. Moser, E. Mujagic, D. MacFarland, T. Zederbauer, H. Detz, A. M. Andrews, W. Schrenk, B. Lendl, and G. Strasser. "Monolithic integrated on-chip sensing utilizing plasmonics". 1st Next-Lite Workshop, Hirschwang an der Rax; 2015-06-18 – 2015-06-19. 2015.
- [24] R. Szedlak, A. Harrer, M. Holzbauer, B. Schwarz, H. Moser, E. Mujagic, C. Deutsch, D. MacFarland, T. Zederbauer, H. Detz, A. M. Andrews, W. Schrenk, K. Unterrainer, B. Lendl, and G. Strasser. "Infrared and terahertz spectroscopy with ring quantum cascade lasers". German THz Conference 2015, Dresden; 2015-06-08 – 2015-06-10. 2015.
- [25] D. Ristanic, B. Schwarz, P. Reininger, H. Detz, A. M. Andrews, W. Schrenk, and G. Strasser. "Monolithical Absorption Sensor Array Based on Bi-functional Quantum Cascade Structures". CLEO 2015, San Jose; 2014-05-10 – 2014-05-15. 2015.
- [26] B. Schwarz, D. Ristanic, P. Reininger, H. Detz, A. M. Andrews, W. Schrenk, and G. Strasser. "A mid-infrared on-chip sensor based on bi-functional quantum cascade structures and plasmonics". SPIE Photonics West 2015, San Francisco; 2015-02-07 – 2015-02-12. 2015.
- [27] P. Reininger, B. Schwarz, Hermann Detz, A. M. Andrews, W. Schrenk, and G. Strasser. "High-responsivity photovoltaic intersubband detectors". SPIE Photonics West 2015, San Francisco; 2015-02-07 – 2015-02-12. 2015.
- [28] B. Schwarz, D. Ristanic, P. Reininger, A. Harrer, H. Detz, A. M. Andrews, W. Schrenk, and G. Strasser. "Monolithically integrated chemical sensor based on intersubband transitions and plasmonics". International Quantum Cascade Lasers School & Workshop (IQCLSW 2014), Bari; 2014-09-07 – 2014-09-14. 2014.
- [29] P. Reininger, B. Schwarz, A. Harrer, T. Zederbauer, H. Detz, A. M. Andrews, R. Gansch, W. Schrenk, and G. Strasser. "Room temperature quantum cascade detector". International Quantum Cascade Lasers School & Workshop (IQCLSW 2014), Bari; 2014-09-07 – 2014-09-14. 2014.
- [30] B. Schwarz, P. Reininger, D. Ristanic, A. M. Andrews, W. Schrenk, and G. Strasser. "Plasmonics and quantum cascade structures for on-chip-sensing". Nanoforum 2014, Linz; 2014-06-01 – 2014-06-24. 2014.
- [31] B. Schwarz, D. Ristanic, P. Reininger, H. Detz, A. M. Andrews, W. Schrenk, and G. Strasser. "A mid-infrared Lab-on-a-Chip: Generating, Guiding and Detecting Light in a Monolithic Device". *Laser Science to Photonic Applications*. CLEO 2014, San Jose; 2014-06-08 – 2014-06-13. 2014. ISBN: 978-1-55752-999-2. web link.
- [32] **(invited)** B. Schwarz, P. Reininger, D. Ristanic, O. Baumgartner, H. Detz, T. Zederbauer, D. MacFarland, A. M. Andrews, W. Schrenk, H. Kosina, and G. Strasser. "On-Chip mid-infrared light generation and detection". ITQW, New York, USA; 2013-09-15 – 2013-09-20. 2013.
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