

Assoc. Prof. Dipl.-Ing. Dr. techn. Holger Arthaber



Personal Details

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Education

2017 TU Wien, Habilitation (Venia Docendi) in “Radio Frequency Engineering”, Habilitation title: “Digitally Driven Switched Mode Power Amplifiers (Amplifier Design, Digital Modulation, and Modeling)”
2000–2004 TU Wien, Doctoral/PhD study, completed with distinction, thesis title: “Harmonic Load Pull Methods”
1995–2000 TU Wien, Diploma study in electrical engineering/communication engineering, focus on signal processing and radio frequency engineering, finished with distinction, thesis title: “Algorithmen zur Kombination von Diversitätssignalen in GSM” (“Algorithms for Diversity Combining in GSM”)

Academic Career and Work Experience

2017–now TU Wien, Institute of Electrodynamics, Microwave and Circuit Engineering (EMCE); Associate Professor, Head of Microwave Engineering Group (full-time)
2015–now Brno University of Technology, Czech Republic, external peer and advisor of Antennas and High-frequency Circuits Group (4h/week)
2009–2017 TU Wien, Institute of Electrodynamics, Microwave and Circuit Engineering; Assistant Professor, Head of Microwave Engineering Group
2000–2008 TU Wien, Institute of Electrical Measurements and Circuit Design; Assistant (Microwave Engineering)
1999–2000 TU Wien, Institute of Communications and Radio Frequency Engineering; Research Assistant
1998–2000 Freelancer (Embedded systems HW/SW-design for several companies)

Achievements

2017 Austrian Standards: Living Standards Awards 2017, Category Projects
2014 Austrian Patent Office: Inventum 2013, top ten patents of the year
2004 TU Wien: Dr. Ernst Fehrer Preis
2004 Arbeitskreis der Hochschullehrer für Messtechnik e.V.: Messtechnik-Preis
2001 Wirtschaftskammer Wien: Technikpreis der Wiener Wirtschaft

Current Teaching

- “RF Simulation Tools” (optional course, 3 ECTS, held 2018–now)
- “Privatissimum for Doctoral Students” (optional course, 3 ECTS, held 2017–now)
- “Seminar for Diploma Students” (optional course, 2 ECTS, held 2014–now)
- “RF Techniques” (mandatory course, 6 ECTS, held 2011–now)
- “Lab RF Techniques” (mandatory course, 3 ECTS, held 2004–now)
- “Advanced RF Techniques” (optional course, 6 ECTS, held 2003–now)
- “Seminar RF Techniques” (optional course, 3 ECTS, held 2003–now)
- “Bachelor Thesis with Seminar” (mandatory course, 10 ECTS, held 2012–now)

Past Teaching

- “Orientation ETIT” (mandatory course, 1 ECTS, held 2017)
- “Seminar for Diploma Students” (mandatory course, 3 ECTS, held 2014–2016)
- “Messtechnik” (mandatory course, 4 ECTS, held 2000–2013)
- “Messtechnik Labor” (mandatory course, 2 ECTS, held 2000–2013)
- “Messgeräte – Eine Einführung” (optional course, 1 ECTS, held 2001–2013)
- “Steuerungstechnik” (optional course, 1 ECTS, held 2000–2012)
- “Projektarbeit (Übergangsregelung B.-Arbeit)” (optional course, 2.5 ECTS, held 2012)
- “Messtechnik, Bakkalaureats-Vertiefung” (optional course, 7.5 ECTS, held 2004–2011)
- “EDV-orientierte Projektarbeit für Elektrotechnik” (optional course, held 2000–2004)
- “Programmierpraktikum” (optional course, held 2000–2004)
- “Messtechnik, Vertiefung” (optional course, held 2003)
- “Hochfrequenztechnik 1” (optional course, held 2002)
- “Elektronische Schaltungstechnik” (optional course, held 2001)
- “Einführungspraktikum Elektrotechnik” (optional course, held 2000)
- “Einf. Elektrotechnik Labor” (optional course, held 2000)

Theses Supervision

- PhD theses: Assistive supervisor of 7 ongoing and 6 finished PhD theses
- Diploma theses: Supervisor of 3 ongoing and 27 finished diploma theses
- Bachelor theses/projects: Supervisor of over 40 finished bachelor theses

Research Interests

- Antenna design and measurements
- Digitally (binary) driven RF power amplifiers
- Load-pull techniques (active/broadband loads, IF-calibration techniques)
- Material characterization
- Microwave sensing
- Microwave system design
- Mixed digital/RF circuits (incl. real-time signal processing)
- Modeling and linearization of RF power amplifiers (with focus on digitally driven amplifiers)
- Nonlinear measurement techniques (LSNA, X-parameters, pulsed measurements)
- RFID systems (channel measurement/emulation, localization algorithms)
- Switched mode power amplifiers

Activities in the Scientific and Academic Community

(Not including non-regular activities)

2018–now	Editorial Board Member of International Journal of RF and Microwave Computer-Aided Engineering
2018–now	Reviewer Research Foundation - Flanders (FWO), Belgium
2017	Organizer of 5 th Workshop of Radio Frequency Working Group (ARGE HFT), September 28 th /29 th , 2017
2017	IEEE Transactions for Microwave Theory and Techniques, Guest Editor for INMMiC-related mini issue
2017	TPC chair, “International Workshop on Integrated Nonlinear Microwave and Millimetre-wave Circuits (INMMiC)”, Graz, Austria, April 20 th –21 st , 2017
2015–now	Co-operation with Brno University of Technology, peer and external advisor of Antennas and High-frequency Circuits Group (INWITE project)
2013–now	Member of “Radio Frequency Working Group of the Austrian Research Association” (ARGE HFT)
2012–now	TPC Member “The European Conference on Antennas and Propagation (EuCAP)”
2012	Panel Member, Academy of Finland, Wireless Data Transfer Review Panel
2012	Contributions to RF teaching of Telecommunication Master Curriculum
2011	Chair and Organizer of “International Workshop on Integrated Nonlinear Microwave and Millimetre-wave Circuits (INMMiC)”, Vienna, Austria April 18 th –19 th , 2011
2011–now	URSI Austria, Head of Commission B (Fields and Waves)
2011–now	TPC Core and Steering Committee Member of “International Workshop on Integrated Nonlinear Microwave and Millimetre-wave Circuits (INMMiC)”
2010–now	Reviewer for “Radioengineering Journal” (Proceedings of Czech and Slovak Technical Universities)
2008–now	TPC Member “The International EURASIP Workshop on RFID Technology”
2008–now	Reviewer for “The European Microwave Conference (EuMC)”
2007	Co-Chair and Co-Organizer of “The First International EURASIP Workshop on RFID Technology”, RFID 2007, Vienna, Austria, September 24 th –25 th , 2007

Skills

- Languages:
 - German (native)
 - English (fluent, all teaching is given in English at present)
- Radio Frequency Engineering specific:
 - Microwave Office (Circuit/System Design: Expert, Field Simulation: Advanced)
 - Ansoft 3D EM High Frequency Structure Simulator (Expert)
 - Maury ATS Load-Pull Measurement System (Expert)
 - CST 3D EM Simulator (Advanced)
 - SONNET 2.5D EM Simulator (Expert)
 - COMSOL (General Knowledge)
 - NSI Nearfield Antenna Measurement Systems (Expert)
 - Keysight 89600-Series Signal Analysis (Expert)
- Additional Technical Skills:
 - Mixed Signal/RF/Digital Co-Design (Expert)
 - VHDL based FPGA Logic and Embedded Design (Advanced)
 - Embedded System Design, Hardware/Software on 8-bit 8051 and 32-bit ARM (Expert)
 - Real-Time Operating Systems (in general: Advanced, FreeRTOS: Expert)
 - Programming Languages: C (Expert), C++ (Advanced), Python (Advanced), MATLAB (Expert)
 - Experienced in CE-Qualification and CE-approved Hardware Design (Expert)
 - SolidEdge 3D CAD Design (Expert)
 - Eagle PCB Design (Expert)

Management Education

- „Teamentwicklung und Managementtraining“ (four day course)
- „ExpertInnen führen ExpertInnen“ (five hours course)
- „Führend Forschen – Forschend Führen“ (one day course)
- „ManagerIn als Beruf“ (two days course)
- „MitarbeiterInnenführung kompakt für WissenschaftlerInnen“ (one day course)

Research Projects

(Projects with a volume < €10,000 omitted)

Active projects

- 10/2019–09/2022 “AMOR” (€ 304,235: project manager of TU Wien; research funding by European Funds for Regional Development EFRE): Development of a low-cost modeling and measurement framework for RF circuits. The project serves as the basis for one PhD and two Master theses at TU Wien.
- 01/2018–12/2024 “CDG Location” (€ 604,686; head of external module of “Christian Doppler Laboratory for Location-aware Electronic Systems”): Studying of various technologies and physical layer interfaces for indoor localization. The project serves as the basis for one PhD thesis at TU Wien.

Finished projects

- 03/2021–06/2021 “UHF Load-Pull” (€ 11.400: project manager of TU Wien, research cooperation with industrial partner): Extension of a load-pull setup to VHF/UHF frequencies for performance characterization of integrated transmitters.
- 04/2020–01/2021 “LDACS Update” (€ 53.087: project manager of TU Wien, subcontractor for industrial partner, research funding by EU SESAR): Evaluating noise floor reduction techniques and open-loop digital predistortion performance for LDACS transmitters.
- 01/2018–12/2020 “InterOP” (€ 212,250; principal investigator, lead partner, and project manager of TU Wien; research funding by European Funds for Regional Development EFRE; total project volume € 653,124): Studying of linear and non-linear interference effects in shared frequency bands. The project served as the basis for one PhD thesis.
- 04/2018–10/2020 “Antenna Modelling” (€ 15,000; project manager of TU Wien; research cooperation with industrial partner): Development of a simulation framework for NFC transponders, including coupling of RF field simulations with nonlinear chip-behavior. The project served as the basis for one PhD thesis at TU Wien.
- 02/2019–11/2019 “3D-HIT” (€ 64,000; project manager of TU Wien, research cooperation with industrial partner): Investigation of the dielectric properties of hay in the microwave region for automatic characterization of selected hay properties.
- 10/2018–03/2019 “SESAR RX” (€ 40.767; project manager of TU Wien; subcontractor for industrial partner, research funding by EU SESAR): Conformance tests of an LDACS receiver and adaptation of an LDACS-compliant transmitter to new frequency bands.
- 10/2015–09/2018 “LIMAR” (€ 288,365; project manager of TU Wien; research funding by Austrian Research Promotion Agency FFG, with industrial partner): Investigation of robust receiver circuits and algorithms for the LDACS airborne communication system. The project served as the basis for one PhD thesis.
- 08/2017–01/2018 “SES RSSI” (€ 15,000; project manager of TU Wien; research cooperation with industrial partner): Characterization of the antenna pattern of electronic shelf labels by coherent nearfield measurements.
- 02/2017–01/2018 “Backscatter Localization” (€ 22,000; project manager of TU Wien; research cooperation with industrial partner): Development of a Δ RCS measurement system for evaluating backscatter localization performance at UHF, 2.45 GHz, and 5.8 GHz. Served as the basis for a Master thesis.
- 10/2014–12/2017 “REFlex” (€ 257,225; principal investigator, consortium head, and project manager of TU Wien; research funding by Austrian Research Promotion Agency FFG, three academic and three industrial partners; total project volume € 937,000): Investigation of UHF RFID ranging with unmodified tags. Includes RF design, signal processing, and FPGA-concept. Interdisciplinary research including studies of ethical implications. Served as basis for three PhD theses (one at TU Wien) and multiple diploma theses.

- 04/2011–09/2015 "TX4Green" (€ 500,000; principal investigator and project manager; research funding by Vienna Science and Technology Fund WWTF): Switched mode power amplifiers with high efficiency. Includes novel design methodology for digitally driven amplifiers, PWM noise shaping and signal processing for 1-bit systems, nonlinear characterization and linearization of systems with quantized input signals. Served as the basis for three PhD theses.
- 11/2012–03/2015 "BoB" (€ 86,250; project manager of TU Wien; subcontractor for industrial partner, funded by EU EUREKA/EURIPIDES): Analysis of a novel flex-connector technology for high speeds analog/digital/RF PCBs including 3D EM-field simulations, test vehicle design and measurements
- 08/2014–01/2015 "Bodenfeuchtesensoren" (€ 12,480; project manager of TU Wien; research funding by Austrian Research Promotion Agency FFG): RF based sensing of soil moisture and salinity. Sensor optimization by 3D EM-field simulation and prototype design of an embedded sensor system.
- 06/2013–12/2013 "A1 Messungen 2.Teil" (€ 21,550; project manager of TU Wien; contract research for industrial partner): RF-performance comparison of UMTS NodeB of different vendors. Design of customer-specific tests for DECT-interference scenarios.
- 06/2012–12/2012 "A1 Messungen" (€ 24,400; project manager of TU Wien; contract research for industrial partner): RF-performance comparison of LTE eNodeB of different vendors.
- 05/2012–12/2012 "Mikrowellen-Feuchtemessung" (€ 10,000; project manager of TU Wien; contract research): Design of a microwave based moisture sensor for cellulose fibers.
- 07/2011–12/2012 "SMM EM-Simulationen" (€ 8,040, project manager of TU Wien; research cooperation with industrial partner): 3D EM-field simulation of a scanning microwave microscope's probe tip and fringing fields. Calibrated measurement of capacitors in the atto/femto-Farad range.
- 06/2011–02/2013 "LDACS1" (€ 199,616; project manager of TU Wien; subcontractor for industrial partner, research funding by EU SESAR): System design and implementation of an L-band OFDM transmitter for airborne applications with high peak power (250 W) and digital pre-distortion. RF/mixed signal/FPGA co-design.
- 03/2011–05/2011 "LVDS-Link" (€ 21,300; project manager of TU Wien; contract research for industrial partner): Measurement system for characterizing high-speed digital video links in automotive applications (TDR and eye-analysis).
- 09/2009–04/2014 "HFA-Timber" (€ 105,859; project manager of TU Wien; research funding by Austrian Research Promotion Agency FFG COMET K-project, with several industrial partners): System design, implementation, and characterization of an X-band system for measuring the grain angle in timber. RF/mixed signal/FPGA/embedded co-design.
- 05/2009–04/2011 "KapNFC" (€ 226,134; project manager of TU Wien; research funding by Austrian Research Promotion Agency FFG, with industrial partner): Body area network for keyless entry applications. 3D EM-field simulations and design of several prototypes. Project resulted in several joint patents with industrial partner.
- 01/2009–05/2009 "WAVE-Richtungsschätzung" (€ 35,000; project manager of TU Wien; contract research for industrial partner): Design of a low complexity angle of arrival measurement system for wireless access in vehicular environments. Project resulted in a granted patent (US, EU and other countries).
- 09/2008–09/2011 "Backscatter" (€ 147,116, research funding, ZiT)
Investigation of novel backscattering-concepts for UHF RFID, design of an FPGA-based real time tag emulator.
- 06/2008–12/2008 "Holz X-Band Scanner" (€ 12,500, contract research)
Linear stage based X-band near field scanner to check the feasibility of microwave based grain angle sensing in timber.
- 01/2008–09/2008 "kapNFC" (€ 35,000, contract research)
Feasibility study for body area network based keyless entry system.
- 12/2007–10/2008 "Reader 868 MHz" (€ 145,160, contract research)
Entire system design of an UHF multi-protocol RFID-reader for automotive applications. Development of an FPGA-implementable (close to optimum) parallel receiver. RF/mixed signal/FPGA co-design.

- 04/2007–03/2009 "Switched" (€ 150,000, research funding, FFG)
Design of an RF power amplifier suited for digital/switched operation. Development of novel load/pull-measurement techniques and design of a prototype amplifier.
- 12/2006–12/2007 "Kanalsimulator 5.8GHz" (€ 104,500, contract research)
Design of an FPGA-based channel emulator for tolling applications including anechoic chamber, RF/mixed signal/FPGA/embedded co-design.
- 07/2006–07/2006 "RFID-Messungen" (€ 10,500, contract research)
Feasibility study for UHF RFID tolling in highway scenarios based on measurements.
- 04/2006–07/2007 "Holz X-Band Messung" (€ 15,860, contract research)
Feasibility study of microwave based grain angle sensing.
- 02/2006–10/2006 "Kanalsimulator 868MHz" (€ 40,000, contract research)
PC-based channel emulator for UHF RFID readers for playback of pre-recorded scenarios.

Publication sorted by dominant research field

(Only fields with ≥ 4 publications listed)

Antenna design and measurement

[J.29], [J.25], [J.19], [J.17], [J.16], [C.82], [C.32], [C.26]

Indoor Localization

[J.33], [C.81], [C.80], [C.79], [C.75], [C.74], [C.69]

Microwave sensing, measurements, and material characterization

[J.32], [J.28], [J.24], [J.21], [J.20], [J.12], [J.10], [J.9], [J.3], [C.77], [C.63], [C.61], [C.54], [C.53], [C.43], [C.40], [C.19]

RF power amplifiers – design of analog PAs

[J.2], [J.1], [C.21], [C.4], [C.3], [I.5]

RF power amplifiers – design of digital switched mode PAs

[J.6], [C.48], [C.42], [C.38], [C.33]

RF power amplifiers – load/source pull

[M.2], [B.1], [J.4], [C.13], [C.12], [C.8], [C.6], [C.5], [I.10], [I.9], [I.8], [I.7], [I.6], [I.4], [I.3], [I.2], [I.1]

RF power amplifiers – nonlinear modeling of digital switched mode PAs

[C.71], [J.18], [J.15], [C.64], [C.60], [C.55], [C.52], [C.49], [C.44], [C.39], [C.37], [C.34]

RF power amplifiers – nonlinear modeling of analogue PAs

[J.27], [C.66], [C.65], [C.62], [C.56], [C.14], [C.11], [C.10], [C.9], [C.7]

RF power amplifiers – signal processing for digital switched mode PAs

[J.11], [J.8], [C.31], [C.30]

Radio frequency identification

[J.31], [C.72], [C.70], [J.26], [J.23], [J.22], [J.14], [J.7], [C.69], [C.68], [C.67], [C.59], [C.58], [C.50], [C.45], [C.28], [C.27], [C.25], [C.24], [C.23], [C.20], [C.18], [C.17], [C.16], [I.14], [I.12], [I.11]

Terahertz electronics

[J.13], [C.47], [C.46], [C.41], [C.35]

Publication list

University publications

- [U.3] H. Arthaber, "Digitally Driven Switched Mode Power Amplifiers (Amplifier Design, Digital Modulation, and Modeling)", Habilitation thesis, TU Wien, Oct. 2017.
- [U.2] H. Arthaber, "Harmonic Load Pull Methods", PhD thesis, TU Wien, March 2004.
- [U.1] H. Arthaber, "Algorithms for Combining Diversity Signals in GSM", diploma thesis, TU Wien, Feb. 2000.

Book chapters

- [B.2] H. Schweinzer, S. F. Shaikat, H. Arthaber, "Media," in *The Industrial Electronics Handbook, second edition*, eds. B. M. Wilamowski and J. D. Irwin, CRC Press, Mar. 2011, pp. 2-1-2-17, doi: 10.1201/b10603-4.
- [B.1] H. Arthaber, M. Mayer: "Source and Load Pull Techniques," in *Characterization and Modelling Approaches for Advanced Linearisation Techniques*, Nov. 2005, pp. 27-62, ISBN 81-308-0027-6.

Journals (peer-reviewed)

- [J.33] D. Neunteufel, S. Grebien, H. Arthaber, "Indoor Positioning of Low-Cost Narrowband IoT Nodes: Evaluation of a TDoA Approach in a Retail Environment," *Sensors* 2022, vol. 22, no. 7, 2663. March 2022, doi: 10.3390/s22072663.
- [J.32] P. Kadera, J. Lacik, H. Arthaber, "Effective Relative Permittivity Determination of 3D Printed Artificial Dielectric Substrates Based on a Cross Unit Cell," *Radioengineering Journal*, vol. 30, no. 4, pp. 595-610, Dec. 2021, doi: 10.13164/re.2021.0595.
- [J.31] M. Pesic, H. A. Westra, A. Levanto, S. Rampetzreiter, W. Pachler, H. Arthaber, "Modeling and Extracting the Nonlinear Input Characteristics of Proximity Coupling Transponder ICs by Utilizing the ISO Measurement Setup," *IEEE Journal of Radio Frequency Identification*, vol. 6, pp. 189-196, Sept. 2021, doi: 10.1109/JRFID.2021.3112799.
- [J.30] H. Kavousi Ghafi, C. Spindelberger, H. Arthaber, "Modeling of Co-channel Interference in Bluetooth Low Energy based on Measurement Data," *EURASIP Journal on Wireless Communications and Networking* 2021, vol. 143 (2021), pp. 1-17, July 2021, doi: 10.1186/s13638-021-02005-2.
- [J.29] T. Mikulasek, J. Puskely, A. G. Yarovoy, J. Lacik, H. Arthaber, "Transverse Slot with Control of Amplitude and Phase for Traveling-Wave SIW Antenna Arrays," *IET Microwave, Antennas & Propagation*, vol. 14, issue 15, pp. 1943-1946, Dec 2020, doi: 10.1049/iet-map.2020.0069.
- [J.28] E. Auerbach, D. Berkov, B. Pichler, N. Leder, S. Gider, H. Arthaber, "Injection locking at fractional frequencies of magnetic tunnel junction (MTJ)-based read sensors' ferromagnetic resonance modes," *Physical Review Applied*, vol. 12, issue 5, pp. 054022-1-12, Nov. 2019, arXiv:1905.08183 [physics.app-ph], doi: 10.1103/PhysRevApplied.12.054022.
- [J.27] B. Pichler, G. Magerl, H. Arthaber, "A Study on Quadratic PHD Models for Large Signal Applications," *IEEE Transactions on Microwave Theory and Techniques*, vol. 67, issue 7, pp. 2514-2520, July 2019, doi: 10.1109/TMTT.2019.2915086.
- [J.26] M. Pesic, J. Gruber, S. Rampetzreiter, H. Wirtschnig, H. Arthaber, "A precise resonance frequency measurement method based on ISO-standardized setups for contactless chip cards," *International Journal of RF and Microwave Computer-Aided Engineering*, vol. 29, issue 5, May 2019, doi: 10.1002/mmce.21702.
- [J.25] P. Vasina, T. Mikulasek, J. Lacik, H. Arthaber, "Beam- and polarization-reconfigurable SIW ring-slot antenna array," *IET Microwave, Antennas & Propagation*, vol. 12, issue 15, pp. 2313-2319. Dec 2018, doi: 10.1049/iet-map.2018.5192.
- [J.24] E. Auerbach, N. Leder, S. Gider, H. Arthaber, "Characterization of MgO-Based Magnetic Tunnel Junctions' Nonlinear Ferromagnetic Resonance Modes," *IEEE Transactions on Magnetics*, vol. 54, issue 2, pp. 1-5, Jan 2018, doi: 10.1109/TMAG.2017.2744659.
- [J.23] F. Galler, S. Grebien, T. Faseth, K. Witrisal, G. Magerl, H. Arthaber, "Extension of an SDR UHF RFID Testbed for MIMO and Monostatic Time of Flight Based Ranging," *IEEE Journal of Radio Frequency Identification*, vol. 1, issue 1, pp. 32-38, Sept. 2017, doi: 10.1109/JRFID.2017.2749200.

- [J.22] S. Grebien, J. Kulmer, F. Galler, M. Goller, E. Leitinger, H. Arthaber, K. Witrals, "Range Estimation and Performance Limits for UHF-RFID Backscatter Channels," *IEEE Journal of Radio Frequency Identification*, vol. 1, issue 1, pp. 39–50, Sept. 2017, doi: 10.1109/JRFID.2017.2749514.
- [J.21] O. Huber, H. Arthaber, "Dielectric Characterization of RF-Printed Circuit Board Materials by Microstrip Transmission Lines and Conductor-Backed Coplanar Waveguides up to 110 GHz," *IEEE Transactions on Microwave Theory and Techniques*, vol. 66, issue 1, pp. 237–244, Jan. 2018, doi: 10.1109/TMTT.2017.2750152.
- [J.20] A. Aichholzer, C. Schuberth, H. Mayer, H. Arthaber, "Microwave Testing of Moist and Oven-Dry Wood to evaluate Grain Angle, Density, Moisture Content and the Dielectric Constant of Spruce from 8 GHz to 12 GHz," *European Journal of Wood and Wood Products*, pp. 1–15, May 2017, doi: 10.1007/s00107-017-1203-x.
- [J.19] J. Puskely, T. Mikulasek, J. Lacik, Z. Raida, H. Arthaber, "SIW-Fed Vivaldi Antenna with Beam Steering Capabilities," *Microwave and Optical Technology Letters*, vol. 59, issue 5, pp. 1022–1027, May 2017, doi: 10.1002/mop.30447.
- [J.18] N. Leder, B. Pichler, T. Faseth, H. Ruotsalainen, H. Arthaber, "Hierarchical Table Based Model for All-Digital RF-Transmitters," *IEEE Transactions on Microwave Theory and Techniques*, vol. 65, issue 3, March 2017, doi: 10.1109/TMTT.2016.2630068.
- [J.17] J. Lambor, J. Lacik, Z. Raida, H. Arthaber, "High-Gain Wideband SIW Offset Parabolic Antenna," *Microwave and Optical Technology Letters*, vol. 58, issue 12, pp. 2888–2892, Dec. 2016, doi: 10.1002/mop.30170.
- [J.16] J. Puskely, J. Lacik, Z. Raida, H. Arthaber, "High Gain Dielectric Loaded Vivaldi Antenna for Ka Band Applications," *IEEE Antennas and Wireless Propagation Letters*, vol. 15, no. 1, pp. 2004–2007, Dec. 2016, doi: 10.1109/LAWP.2016.2550658.
- [J.15] H. A. Ruotsalainen, N. Leder, B. Pichler, H. Arthaber, G. Magerl, "Equivalent Complex Baseband Model for Digital Transmitters Based on 1-bit Quadrature Pulse Encoding," *IEEE Transactions on Circuits and Systems-I: Regular Papers*, vol. 62, no. 11, pp. 2739–2747, Oct. 2015, doi: 10.1109/TCSI.2015.2476395.
- [J.14] H. Arthaber, T. Faseth, F. Galler, "Spread-Spectrum Based Ranging of Passive UHF EPC RFID Tags," *IEEE Communications Letters*, vol. 19, no. 10, pp. 1734–1737, Oct. 2015, doi: 10.1109/LCOMM.2015.2469664.
- [J.13] D. Bachmann, N. Leder, M. Rösch, G. Scalari, M. Beck, H. Arthaber, J. Faist, K. Unterrainer, J. Darmo, "Broadband terahertz amplification in a heterogeneous quantum cascade laser," *Optics Express*, vol. 23, no. 3, pp. 3117–3125, Feb. 2015, doi: 10.1364/OE.23.003117.
- [J.12] J. K. Denzler, C. Lux, H. Arthaber, "Contactless moisture content and density evaluation of sawn timber using microwave transmission," *International Wood Products Journal*, vol. 5, no. 4, pp. 200–206, Nov. 2014, doi: 10.1179/2042645314Y.0000000066.
- [J.11] H. A. Ruotsalainen, H. Arthaber, T. I. Laakso, G. Magerl, "Quantization Noise Reduction Techniques for Digital Pulsed RF Signal Generation Based on Quadrature Noise Shaped Encoding," *IEEE Transactions on Circuits and Systems-I: Regular Papers*, vol. 61, no. 9, pp. 2525–2536, July 2014, doi: 10.1109/TCSI.2014.2332259.
- [J.10] A. Aichholzer, H. Arthaber, C. Schuberth, H. Mayer, "Non-Destructive Evaluation of Grain Angle, Moisture Content and Density of Spruce with Microwaves," *European Journal of Wood and Wood Products*, vol. 71, no. 6, pp. 779–786, Nov. 2013, doi: 10.1007/s00107-013-0740-1.
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Patents

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