

# Uwe Siart

Dr.-Ing.

Arcisstr. 21  
80333 München  
Germany

☎ +49 89 289-23374

FAX +49 89 289-23365

✉ uwe.siart@tum.de

🌐 www.hft.ei.tum.de



## Personal details

Gender male  
Nationality german  
Year of birth 1969  
Place of birth Bayreuth, Germany  
Current position Senior Research Associate at the Chair of High-Frequency Engineering of the Technical University of Munich

## Education

7/2005 **Dr.-Ing.**, Technical University of Munich, Chair of High-Frequency Engineering.  
Topic: Model Based Signal Processing for Mutually Incoherent Radar Sensors  
7/1996 **Dipl.-Ing.**, Friedrich-Alexander-Universität Erlangen-Nürnberg.  
Electrical Engineering, branch of study: Communications Engineering

## Experience

since 6/2005 Senior Research Associate at the Chair of High-Frequency Engineering of the Technical University of Munich, third-party funds applications, research proposals, project management  
10/2011–09/2016 Associate Professorship of Electromagnetic Compatibility and Wave Propagation at the Technical University of Munich  
11/1996–6/2005 Research Associate and doctoral candidate at the Chair of High-Frequency Engineering of the Technical University of Munich, IT supervisor, webmaster

## Research

since 10/2008 Methods for modeling of electromagnetic fields and radiation under stochastic boundary conditions, remote sensing of ground precipitation by terrestrial microwave links, signal processing for high-frequency sensors in production engineering  
7/2005–9/2008 Electromagnetic properties of nano coatings, effect of mutual coupling in array antennas on system performance, system identification for efficient modeling of distributed microwave structures  
6/2001–6/2005 Methods for coherent processing of radar information from multiple incoherent radar sensors, time series analysis, spectral estimation, radar using multiple frequency bands

- 4/1999–5/2001 Signal processing for array antennas, calibration, mutual coupling compensation, bearing estimation
- 11/1996–3/1999 Signal processing for a multi-functional automotive radar sensor, automatic sequence control, radar ranging, polarimetry, scattering at moving random rough surfaces, short time parameter estimation

## Teaching

- since 10/2013 Graduate course “Radar Signals and Systems”
- since 10/2012 Undergraduate course “Wellenausbreitung und Übertragungstechnik (LB)”
- since 4/2012 Undergraduate course “Grundlagen der Hochfrequenztechnik (LB)”
- since 4/2009 Undergraduate course “Hochfrequenzschaltungen”
- 2009–2013 Graduate course “High-Frequency Circuit Design”
- 2004–2009 Graduate courses “Linear and Nonlinear Microwave Circuits I + II”
- since 2003 Coauthor of the textbook “Detlefsen, Siart: Grundlagen der Hochfrequenztechnik (München, Oldenbourg, 4th ed. 2012)”
- 5/1998–7/2004 Advisor for lectures and events for students of teaching degree at vocational schools (supervising tutor in “Grundlagen der Hochfrequenztechnik (LB)” and “Hochfrequenztechnik (LB)”, compilation of the lecture documents and supplementary documents, elaboration of the written exams)
- Examiner, mostly within the First State Examination in the study program “Lehramt an Beruflichen Schulen” with emphasis on electrical engineering
- 11/1996–7/2004 Supervising tutor in the lab courses “Rundfunk- und Fernsehtechnik” and “Hochfrequenztechnik/Mikrowellentechnik”

## Administrative tasks

- since 10/2009 Staff and financial administration of the Chair of High-Frequency Engineering of the Technical University of Munich
- 2004–2013 Assistant Registrar of the examination board within the Department of Electrical and Computer Engineering of the Technical University of Munich
- 2006–2007 Chairman of the EMC Zürich 2007 local organizing committee
- 2004–2009 Scientific coordinator of the international study program “Master of Science in Microwave Engineering”
- 2004 TPC member of the European Conference on Wireless Technologies 2004
- 2002–2003 Reviewer and Conference Secretary of the European Conference on Wireless Technologies 2003
- 1999–2004 Organization and arrangement of the annual training seminar “Fortschritte in der Elektrotechnik und Informationstechnik” for vocational school teachers

## Language proficiency

- German mother tongue
- English CEFR level B2 (independent user, vantage level)
- French CEFR level A1 (basic user, breakthrough level)

---

## Memberships

Institute of Electrical and Electronics Engineers (IEEE)  
IEEE Microwave Theory and Techniques Society (MTT-S)  
MTT Technical Committee 15 (MTT-15 Microwave Field Theory)  
European Microwave Association (EuMA)  
International Union of Radio Science (URSI) Commission B  
ITG-Fachausschuss 7.5 “Wellenausbreitung”  
Verein Deutscher Ingenieure (VDI)  
Deutschsprachige Anwendervereinigung TeX (DANTE e. V.)

---

## Publications

- [1] G. F. Hamberger, U. Siart, and T. F. Eibert: “A Dual-Linearly Polarized Receive Antenna Array for Digital Beamforming in Automotive Use”. In: *Asia Pacific Microwave Conference (APMC)*. Kuala Lumpur, Malaysia, November 13–16, 2017. Accepted for publication.
- [2] C. Koenen, U. Siart, and T. F. Eibert: “Millimeter-Wave Gaussian Beam Shaping and Steering Phased Array Antenna”. In: *Proc. European Radar Conference (EuRAD)*. Nuremberg, Germany, October 11–13, 2017. Accepted for publication.
- [3] T. Mittermaier, U. Siart, and T. F. Eibert: “Recursive Cramér-Rao Bounds of Doppler-Based Localization in Short-Range Radar”. In: *Proc. European Radar Conference (EuRAD)*. Nuremberg, Germany, October 11–13, 2017. Accepted for publication.
- [4] S. Trummer, G. F. Hamberger, R. Koerber, U. Siart, and T. F. Eibert: “Performance Analysis of 79 GHz Polarimetric Radar Sensors for Autonomous Driving”. In: *Proc. European Radar Conference (EuRAD)*. Nuremberg, Germany, October 11–13, 2017. Accepted for publication.
- [5] C. Koenen, G. F. Hamberger, U. Siart, T. F. Eibert, H.-U. Nickel, G. D. Conway, and U. Stroth: “A Low-Reflectivity Vacuum Window for Rectangular Hollow Waveguides”. In: *IEEE Trans. Microw. Theory Techn.* MTT-65.9 (September 2017), pp. 1–8. Currently available in Early Access.
- [6] C. Koenen, U. Siart, and T. F. Eibert: “A Low-Reflectivity Vacuum Window”. In: *Kleinheubacher Tagung*. Miltenberg, Germany, September 25–27, 2017.
- [7] H. Azodi, U. Siart, and T. Eibert: “Sparse representation discretization errors in multi-sensor radar target motion estimation”. In: *Advances in Radio Science* 15 (September 21, 2017), pp. 69–76. DOI: 10.5194/ars-15-69-2017. URL: <https://www.adv-radio-sci.net/15/69/2017/> (visited on 09/21/2017).
- [8] C. Moroder, U. Siart, Ch. Chwala, and H. Kunstmann: “Fundamental Study of Wet Antenna Attenuation”. In: *15th International Conference on Environmental Science And Technology (CEST)*. Rhodes, Greece, August 31–September 2, 2017.
- [9] G. F. Hamberger, S. Trummer, U. Siart, and T. F. Eibert: “Circularly Polarized Antenna Array for Automotive Applications”. In: *42nd International Conference on Infrared, Millimeter and Terahertz Waves (IRMMW-THz)*. Cancún, México, August 27–September 1, 2017.
- [10] C. Koenen, U. Siart, and T. Eibert: “Computation of Reflector Contours for Gaussian Beam Shaping Phased Array Antenna Elements”. In: *IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting (APS/URSI)*. San Diego, California, July 9–14, 2017.
- [11] D. Bok, D. Galda, and U. Siart: “A Multistatic Passive Coherent Location System with Receiver Location Constraints”. In: *International Radar Symposium (IRS)*. Prague, Czech Republic, June 28–30, 2017.

- [12] C. Koenen, U. Siart, T. F. Eibert, G. D. Conway, and U. Stroth: "A Broadband Millimeter-Wave Hollow Waveguide Coupling Structure Configured by a Wire-Eroded Metal Plug-In". In: *IEEE Microw. Wireless Compon. Lett.* 27.5 (May 2017), pp. 434–436.
- [13] C. Koenen, U. Siart, T. F. Eibert, and G. D. Conway: "A Self-Aligning Cylindrical Sliding Short Plunger for Millimeter-Wave Rectangular Waveguides and its Application in a Reflection-Type Phase Shifter". In: *IEEE Trans. Microw. Theory Techn.* MTT-65.2 (February 2017), pp. 449–458.
- [14] G. F. Hamberger, S. Trummer, U. Siart, and T. F. Eibert: "A Planar Dual-Polarized Microstrip 1-D-Beamforming Antenna Array for the 24 GHz Band". In: *IEEE Trans. Antennas Propag.* AP-65.1 (January 2017), pp. 142–149.
- [15] G. F. Hamberger, S. Trummer, U. Siart, and T. F. Eibert: "A Single Layer Dual Linearly Polarized Microstrip Patch Antenna Array for Automotive Applications in the 77 GHz Band". In: *IEEE International Symposium on Phased Array Systems and Technology (PAST)*. Waltham, MA, USA, October 18–21, 2016.
- [16] C. Koenen, U. Siart, T. Eibert, G. Conway, and U. Stroth: "Design of a Millimeter-Wave Phased Array Antenna for Gaussian Beam Shaping and Steering". In: *IEEE International Symposium on Phased Array Systems and Technology (PAST)*. Waltham, MA, USA, October 18–21, 2016.
- [17] S. Trummer, G. F. Hamberger, U. Siart, and T. F. Eibert: "A Polarimetric 76–79 GHz Radar-Frontend for Target Classification in Automotive Use". In: *Proc. European Radar Conference (EuRAD)*. London, UK, October 5–7, 2016.
- [18] T. Mittermaier, U. Siart, T. F. Eibert, and S. Bonerz: "Extended Kalman Doppler tracking and model determination for multi-sensor short-range radar". In: *Advances in Radio Science* 14 (September 28, 2016), pp. 39–46. DOI: 10.5194/ars-14-39-2016. URL: <http://www.adv-radio-sci.net/14/39/2016/> (visited on 09/28/2016).
- [19] H. Azodi, U. Siart, and T. F. Eibert: "Sparse Representation Discretization Errors in Multi-Sensor Radar Target Motion Estimation". In: *Kleinheubacher Tagung*. Miltenberg, Germany, September 26–28, 2016.
- [20] G. Hamberger, S. Trummer, U. Siart und T. Eibert: „Planares polarimetrisches Radarsystem für Automobilanwendungen“. In: *Kleinheubacher Tagung*. Miltenberg, Germany, 26.–28. September 2016.
- [21] C. Koenen, U. Siart, T. F. Eibert, G. D. Conway, and U. Stroth: "A Millimeter-Wave Phased Array Antenna for Small-Scale Plasma Turbulence Studies on ASDEX Upgrade Tokamak". In: *Kleinheubacher Tagung*. Miltenberg, Germany, September 26–28, 2016.
- [22] T. Mittermaier, U. Siart, and T. Eibert: "Target Tracking in Industrial Multi-Sensor Short-Range Radar Applications Using Doppler and Amplitude Information". In: *IEEE International Conference on Multi-sensor Fusion and Integration for Intelligent Systems (MFI)*. Baden-Baden, Germany, September 19–21, 2016.
- [23] T. Mittermaier, U. Siart, and T. Eibert: "Accuracy Analysis of Short-Range Doppler Shift Target Localization Using a Multi-Sensor Platform". In: *IEEE Radar Conference*. Philadelphia, PA, USA, May 2–6, 2016.
- [24] H. Azodi, C. Koenen, U. Siart, and T. F. Eibert: "Empirical Discretization Errors in Sparse Representations for Motion State Estimation with Multi-Sensor Radar Systems". In: *10th European Conference on Antennas and Propagation (EuCAP)*. Davos, Switzerland, April 10–15, 2016.
- [25] G. F. Hamberger, A. Drexler, S. Trummer, U. Siart, and T. F. Eibert: "A Planar Dual-Polarized Microstrip 1D-Beamforming Antenna Array for the 24 GHz ISM-Band". In: *10th European Conference on Antennas and Propagation (EuCAP)*. Davos, Switzerland, April 10–15, 2016.
- [26] C. Koenen, G. F. Hamberger, U. Siart, and T. F. Eibert: "A Volumetric Near-Field Scanner for Millimeter-Wave Antenna Measurements". In: *10th European Conference on Antennas and Propagation (EuCAP)*. Davos, Switzerland, April 10–15, 2016.

- [27] C. Koenen, U. Siart, T. F. Eibert, G. D. Conway, and U. Stroth: “A Configurable Coupling Structure for Broadband Millimeter-Wave Split-Block Networks”. In: *IEEE Trans. Microw. Theory Techn.* MTT-63.12 (December 2015), pp. 3954–3961.
- [28] G. Hamberger, S. Trummer, U. Siart, and T. Eibert: “A Planar Dual-Polarized Microstrip Antenna Array in Series-Parallel Feed Configuration”. In: *Loughborough Antennas and Propagation Conference*. Loughborough, UK, November 2–3, 2015.
- [29] G. Hamberger, S. Trummer, U. Siart und T. Eibert: „Untersuchung eines Antennenelementes zur Verwendung in einem planaren, zweifach linear polarisiertem Antennenarray“. In: *Kleinheubacher Tagung*. Miltenberg, Germany, 28.–30. September 2015.
- [30] T. Wächter, U. Siart, T. Eibert, and S. Bonerz: “Extended Kalman Doppler Tracking and Model Determination for Multi-Sensor Short-Range Radar”. In: *Kleinheubacher Tagung*. Miltenberg, Germany, September 28–30, 2015.
- [31] T. Spreng, S. Yuan, V. Valenta, H. Schumacher, U. Siart, and V. Ziegler: “Wideband 120 GHz to 140 GHz MIMO Radar: System Design and Imaging Results”. In: *Proc. European Radar Conference (EuRAD)*. Paris, France, September 9–11, 2015.
- [32] T. Wächter, U. Siart, and T. F. Eibert: “Weighted Phase Difference Short-Time Doppler Estimation and Fixed-Gain Tracking for Industrial Sensor Applications”. In: *Proc. European Radar Conference (EuRAD)*. Paris, France, September 9–11, 2015.
- [33] U. Faz, U. Siart, T. F. Eibert, and T. Hermann: “Electric Field Homogeneity Optimization by Dielectric Inserts for Improved Material Sensing in a Cavity Resonator”. In: *IEEE Trans. Instrum. Meas.* IM-64.8 (August 2015), pp. 2239–2246. DOI: 10.1109/TIM.2015.2393397.
- [34] U. Stroth, A. Bañón Navarro, A. Biancalani, C. Bottreau, F. Clairet, S. Coda, G.D. Conway, T. Eibert, A. Fasoli, T. Görler, Ö. Gürcan, P. Hennequin, T. Happel, A. Hetzenecker, M. Hirsch, F. Jenko, W. Kasperek, A. Krämer-Flecken, C. Lechte, A. Medvedeva, D. Molina, L. Porte, D. Prisiazhniuk, U. Siart, P. Simon, C. Koenen, L. Vermare, S. Wolf, and the ASDEX Upgrade team: “Experimental turbulence studies for gyro-kinetic code validation using advanced microwave diagnostics”. In: *Nuclear Fusion* 55.8 (August 2015). DOI: 10.1088/0029-5515/55/8/083027.
- [35] U. Faz, U. Siart, and T. Eibert: “A Cylindrical Cavity Resonator for Material Measurements with Coupled Resonant Modes for Sensing and Position Offset Compensation of the Dielectric Specimen”. In: *German Microwave Conference (GeMiC)*. Nürnberg, Germany, March 16–18, 2015, pp. 36–39. DOI: 10.1109/GEMIC.2015.7107746.
- [36] C. Koenen, U. Siart, T. Eibert, G. Conway, and U. Stroth: “Broadband Amplitude Tapering for a Linear W-Band Array Antenna for Gaussian Beam-Shaping”. In: *German Microwave Conference (GeMiC)*. Nürnberg, Germany, March 16–18, 2015, pp. 202–204. DOI: 10.1109/GEMIC.2015.7107788.
- [37] C. Koenen, U. Siart, T. Eibert, G. Conway, and U. Stroth: “Methods for Optimum Aperture Tapering in a Near-Field Focusing Linear W-Band Horn Array”. In: *Fachtagung des ITG-Fachausschusses 7.5, WFMN 2015*. Chemnitz, Germany, February 10–13, 2015.
- [38] H. Kunstmann, C. Chwala, F. Keis, U. Siart, J. Seltmann, and R. Gerigk: “Precipitation Quantification by Analysis of Microwave Link Data from Commercial Cellphone Providers”. In: *Fachtagung des ITG-Fachausschusses 7.5, WFMN 2015*. Chemnitz, Germany, February 10–13, 2015.
- [39] H. Azodi, U. Siart, and T.F. Eibert: “A Fast 3-D Deterministic Ray Tracing Coverage Simulator Including Creeping Rays Based On Geometry Voxelization Technique”. In: *IEEE Trans. Antennas Propag.* AP-63.1 (January 2015), pp. 210–220. DOI: 10.1109/TAP.2014.2365572.
- [40] T. Wächter, U. Siart, T. Eibert, and S. Bonerz: “Multi-sensor Doppler radar for machine tool collision detection”. In: *Advances in Radio Science* 12 (November 10, 2014), pp. 35–41. DOI: 10.5194/ars-12-35-2014. URL: <http://www.adv-radio-sci.net/12/35/2014/> (visited on 01/11/2015).

- [41] O. Wiedenmann, R. Ramakrishnan, P. Saal, E. Kılıç, U. Siart, T. Eibert, and W. Volk: “Local microwave heating of sand molds as a means to overcome design limitations in sand mold casting”. In: *Advances in Radio Science* 12 (November 10, 2014), pp. 21–28. DOI: 10.5194/ars-12-21-2014. URL: <http://www.adv-radio-sci.net/12/21/2014/> (visited on 01/11/2015).
- [42] U. Stroth, A. Bañón Navarro, A. Biancalani, C. Bottereau, F. Clairet, S. Coda, G.D. Conway, T. Eibert, A. Fasoli, T. Görler, Ö. Gürçan, P. Hennequin, T. Happel, A. Hetzenecker, M. Hirsch, F. Jenko, W. Kasperek, A. Krämer-Flecken, C. Lechte, A. Medvedeva, D. Molina, L. Porte, D. Prisiazhniuk, U. Siart, P. Simon, C. Koenen, L. Vermare, S. Wolf, and the ASDEX Upgrade team: “Experimental turbulence studies for gyro-kinetic code validation using advanced microwave diagnostics”. In: *25th Fusion Energy Conference (FEC)*. International Atomic Energy Agency (IAEA). St. Petersburg, Russia, October 13–18, 2014.
- [43] H. Azodi, U. Siart, and T. F. Eibert: “A Study of Compressed Sensing Based Collision Detection From Multi-Sensor CW Radar Data”. In: *Proc. European Radar Conference (EuRAD)*. Rome, Italy, October 8–10, 2014, pp. 269–272.
- [44] C. Koenen, U. Siart, T. Eibert, G. Conway, and U. Stroth: “Broadband Gaussian Beam-Shaping in a 32-Element Linear W-Band Horn Array”. In: *Kleinheubacher Tagung*. Miltenberg, Germany, September 29–October 1, 2014.
- [45] H. Azodi, U. Siart, and T. Eibert: “Compressed Sensing for Near Range MIMO Radar in Multipath Environment”. In: *IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting (APS/URSI)*. Memphis, TN, USA, July 6–11, 2014.
- [46] K. Wang, A. Paulus, T. J. Wächter, U. Siart, and T. F. Eibert: “Compact CW Radar Transceiver Antennas with Novel Decoupling Technique Based on Neutralization”. In: *8th European Conference on Antennas and Propagation (EuCAP)*. The Hague, The Netherlands, April 6–11, 2014.
- [47] H. Azodi, T. J. Wächter, U. Siart, T. F. Eibert, and S. Bonerz: “Compressed Sensing Approach for Fast Collision Warning Radar”. In: *German Microwave Conference (GeMiC)*. Aachen, Germany, March 10–12, 2014.
- [48] A. Kirschner, U. Siart, J. Gütlein, and J. Detlefsen: “A Design Algorithm for MIMO Radar Antenna Setups with Minimum Redundancy”. In: *International IEEE Conference on Microwaves, Communications, Antennas and Electronic Systems (COMCAS)*. Tel Aviv, Israel, October 21–23, 2013.
- [49] V. Đorđević, O. Pronić-Rančić, Z. Marinković, M. Milijić, V. Marković, U. Siart, C. Chwala, and H. Kunstmann: “ANN Applications in Detection of Precipitation Based on the Received Signal Level of Commercial Microwave Links”. In: *11th International Conference on Telecommunications in Modern Satellite, Cable and Broadcasting Services (TELSIKS)*. Niš, Serbia, October 16–19, 2013.
- [50] T. Spreng, U. Prechtel, B. Schönlinner, A. Meusling, U. Siart, and V. Ziegler: “UWB Near-Field MIMO Radar: Calibration, Measurements and Image Reconstruction”. In: *Proc. European Radar Conference (EuRAD)*. Nuremberg, Germany, October 9–11, 2013.
- [51] U. Faz, U. Siart, T. Eibert, T. Hermann, and M. Ueding: “Improved Electric Field Distribution by Utilizing Profiled Dielectric Inserts Inside Cavity Resonators with Through-Opening for Material Stream Evaluation”. In: *Kleinheubacher Tagung*. Miltenberg, Germany, September 23–25, 2013.
- [52] T. Wächter, U. Siart, T. Eibert, and S. Bonerz: “Multi-Sensor Doppler Radar for Machine Tool Collision Detection”. In: *Kleinheubacher Tagung*. Miltenberg, Germany, September 23–25, 2013.
- [53] O. Wiedenmann, R. Ramakrishnan, E. Kılıç, P. Saal, U. Siart, and T. Eibert: “Local Microwave Heating as a Means to Overcome Design Limitations in Metal Casting Processes”. In: *Kleinheubacher Tagung*. Miltenberg, Germany, September 23–25, 2013.
- [54] U. Siart, T. Wächter und S. Bonerz: „Radarbasierte Kollisionsverhütung in der Werkzeugmaschine“. In: *MM Maschinenmarkt* 28/29 (8. Juli 2013). Sonderausgabe zur EMO Hannover, S53–S55.

- [55] H. Azodi, U. Siart, and T. Eibert: "A Fast Three-Dimensional Deterministic Ray Tracing Coverage Simulator for a 24 GHz Anti-Collision Radar". In: *Advances in Radio Science* 11 (July 4, 2013), pp. 55–60. DOI: 10.5194/ars-11-55-2013. URL: <http://www.adv-radio-sci.net/11/55/2013/> (visited on 04/15/2017).
- [56] Ch. Chwala, H. Kunstmann, and U. Siart: "A dual-frequency dual-polarization monostatic microwave transmission experiment for precipitation and humidity observation". In: *11th International Precipitation Conference (IPC)*. Wageningen, The Netherlands, June 30–July 3, 2013.
- [57] Ch. Cherif, A. Nocke, U. Faz, U. Siart, and T. Eibert: "Non-Contact Characterization of Textile Material Compounds by Microwave Resonator Measurements". In: *13th AUTEX World Textile Conference*. Dresden, Germany, May 22–24, 2013.
- [58] E. Kılıç, G. Schnattinger, U. Siart, and T. Eibert: "Electromagnetic Modelling of Material Loaded Cavity Resonators with a Filling Hole for Complex Resonant Frequency Determination". In: *URSI Commission B International Symposium on Electromagnetic Theory (EMTS)*. Hiroshima, Japan, May 20–24, 2013.
- [59] E. Kılıç, U. Siart, O. Wiedenmann, U. Faz, R. Ramakrishnan, P. Saal, and T. Eibert: "Cavity Resonator Measurement of Dielectric Materials Accounting for Wall Losses and a Filling Hole". In: *IEEE Trans. Instrum. Meas.* IM-62.2 (February 2013), pp. 401–407.
- [60] J. Detlefsen und U. Siart: *Grundlagen der Hochfrequenztechnik*. 4. Aufl. München: Oldenbourg, 2012.
- [61] E. Kılıç, U. Siart, and T. Eibert: "Determination of Complex Resonant Frequencies of Resonators Loaded with Dielectric Materials". In: *Proc. 42nd European Microwave Conference*. Amsterdam, The Netherlands, October 28–November 1, 2012.
- [62] K. Wang, L. Li, C. Schmidt, S. Bonerz, U. Siart, and T. Eibert: "A coaxial line based propagation channel for wireless communication between rotating machine components". In: *10th International Symposium on Antennas, Propagation and EM Theory (ISAPE)*. Xi'an, China, October 22–26, 2012, pp. 721–724.
- [63] H. Azodi, U. Siart, and T. Eibert: "A Fast Three-Dimensional Deterministic Ray Tracing Coverage Simulator for a 24 GHz Anti-Collision Radar". In: *Kleinheubacher Tagung*. Miltenberg, Germany, September 24–26, 2012.
- [64] U. Siart, S. Adrian, and T. Eibert: "Properties of axial surface waves along dielectrically coated conducting cylinders". In: *Advances in Radio Science* 10 (September 18, 2012), pp. 79–84. DOI: 10.5194/ars-10-79-2012. URL: <http://www.adv-radio-sci.net/10/79/2012/> (visited on 10/07/2012).
- [65] C. Chwala, A. Gmeiner, W. Qiu, S. Hipp, D. Nienaber, U. Siart, T. Eibert, M. Pohl, J. Seltmann, J. Fritz, and H. Kunstmann: "Precipitation observation using microwave backhaul links in the alpine and pre-alpine region of Southern Germany". In: *Hydrology and Earth System Sciences* 16.8 (August 2012), pp. 2647–2661. DOI: 10.5194/hess-16-2647-2012. URL: <http://www.hydrol-earth-syst-sci.net/16/2647/2012/>.
- [66] T. Franke, R. Blokker, W. McGlaun, J. Köppl, A. Bartsch, M. Vögerl, and U. Siart: "RF-Fingerprint of Vacuum Power Tubes (at the Example of the CQK200-4A) in Fusion Research at IPP Garching". In: *3rd ITG International Vacuum Electronics Workshop*. Physikzentrum Bad Honnef, Germany, August 20–21, 2012.
- [67] Ch. Chwala, H. Kunstmann, S. Hipp, U. Siart, and T. Eibert: "Precipitation Observation Using Commercial Microwave Communication Links". In: *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*. Munich, Germany, July 22–27, 2012, pp. 2922–2925. DOI: 10.1109/IGARSS.2012.6350714.
- [68] S. Hipp, U. Siart, T. Eibert, Ch. Chwala, and H. Kunstmann: "Modelling of Electromagnetic Transmission Through Rain Fields Based on Drop-Scale Scattering". In: *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*. Munich, Germany, July 22–27, 2012.
- [69] E. Kılıç, U. Siart, and T. Eibert: "Regularized 1-D Dielectric Profile Inversion in a Uniform Metallic Waveguide by Measurement and Simulation". In: *IEEE Trans. Microw. Theory Techn.* MTT-60.5 (May 2012), pp. 1437–1443.

- [70] E. Kılıç, U. Siart, C. Schmidt, and T. Eibert: “Characterization of Dielectric Materials Using Partially Loaded Waveguide Measurements”. In: *German Microwave Conference (GeMiC)*. Ilmenau, Germany, March 12–14, 2012.
- [71] O. Wiedenmann, R. Ramakrishnan, E. Kılıç, P. Saal, U. Siart, and T. Eibert: “A Multi-Physics Model for Microwave Heating in Metal Casting Applications Embedding a Mode Stirrer”. In: *German Microwave Conference (GeMiC)*. Ilmenau, Germany, March 12–14, 2012.
- [72] Ch. Chwala, U. Siart, S. Hipp, T. Eibert, and H. Kunstmann: “Remote sensing of precipitation and humidity using commercial microwave links and a monostatic transmission experiment”. In: *12th Specialist Meeting on Microwave Radiometry and Remote Sensing of the Environment (MicroRAD)*. Rome, Italy, March 5–9, 2012.
- [73] U. Siart, S. Hipp, Ch. Chwala, T. Eibert, and H. Kunstmann: “Efficient Modelling of Rain Field Microwave Attenuation and Doppler Noise for Different Drop Size Distributions”. In: *12th Specialist Meeting on Microwave Radiometry and Remote Sensing of the Environment (MicroRAD)*. Rome, Italy, March 5–9, 2012.
- [74] U. Siart: “HF Hardware in a Nutshell: How Millimeter-Wave Links work”. Winter School “Regional Precipitation Observation by Cellular Network Microwave Attenuation and Application to Water Resources Management”. Institute for Meteorology and Climate Research, Garmisch-Partenkirchen, Germany, February 27–March 2, 2012.
- [75] U. Siart: “Theory of Millimeter Wave Scattering”. Winter School “Regional Precipitation Observation by Cellular Network Microwave Attenuation and Application to Water Resources Management”. Institute for Meteorology and Climate Research, Garmisch-Partenkirchen, Germany, February 27–March 2, 2012.
- [76] U. Siart: „Spindelkollisionsschutz auf Radarbasis“. Technologietagung. Ott-Jakob Spanntechnik GmbH, Lengenwang, Germany, 30. November 2011.
- [77] J. E. E. Seltmann, H. Kunstmann, Ch. Chwala, W. Qiu, U. Siart, and S. Hipp: “Exploiting commercial Cell Phone Links to measure Precipitation in Southern Germany”. In: *35th Conference on Radar Meteorology*. Pittsburgh, PA, September 26–30, 2011.
- [78] J. E. E. Seltmann and U. Siart: “Measuring Radome Panel High-Frequency Properties”. In: *35th Conference on Radar Meteorology*. Pittsburgh, PA, September 26–30, 2011.
- [79] Ch. Chwala, U. Siart, S. Hipp, T. Eibert, and H. Kunstmann: “Remote Sensing of Precipitation and Atmospheric Humidity by Microwave Transmission”. In: *Kleinheubacher Tagung*. Miltenberg, Germany, September 26–28, 2011.
- [80] S. Hipp, U. Siart, Ch. Chwala, T. Eibert, and H. Kunstmann: “Improved Numerical Efficiency for Modelling of Electromagnetic Attenuation and Noise from Rain Fields with Different Rain Rate”. In: *Kleinheubacher Tagung*. Miltenberg, Germany, September 26–28, 2011.
- [81] U. Siart, S. Adrian, and T. Eibert: “Properties of Axial Surface Waves Along Dielectrically Coated Conducting Cylinders”. In: *Kleinheubacher Tagung*. Miltenberg, Germany, September 26–28, 2011.
- [82] E. Kılıç, U. Siart, C. Schmidt, and T. Eibert: “Measurement of Dielectric Materials using CST Microwave Studio”. In: *URSI General Assembly and Scientific Symposium*. Istanbul, Turkey, August 13–20, 2011.
- [83] A. Ott, M. Shalaby, T. Eibert, U. Siart, E. Kaliyaperumal, J. Engelbrecht, and R. Collmann: “Performance Analysis of a Low Cost Wireless Indoor Positioning System with Distributed Antennas”. In: *Advances in Radio Science* 9 (July 29, 2011), pp. 79–84. DOI: 10.5194/ars-9-79-2011. URL: <http://www.adv-radio-sci.net/9/79/2011/> (visited on 05/22/2013).
- [84] S. Hipp, U. Siart, Ch. Chwala, T. Eibert, and H. Kunstmann: “Dynamic Modelling of Atmospheric Microwave Transmission for Precipitation Quantification using Mie Scattering”. In: *5th European Conference on Antennas and Propagation (EuCAP)*. Rome, Italy, April 11–15, 2011.



- [85] A. Ott, M. Shalaby, U. Siart, R. Brem, T. Eibert, J. Engelbrecht, and R. Collmann: "System Simulation of a Localization System Based on Power Level Detection with Distributed Antennas". In: *5th European Conference on Antennas and Propagation (EuCAP)*. Rome, Italy, April 11–15, 2011.
- [86] Ch. Chwala, W. Qiu, S. Hipp, H. Kunstmann, U. Siart, J. Seltmann, and M. Pohl: "Wet/Dry-Estimation Algorithm for Commercial Backhaul Link Attenuation Data to Derive Precipitation Intensity in Alpine Terrain". In: *European Geoscience Union General Assembly (EGU)*. Vienna, Austria, April 3–8, 2011.
- [87] S. Hipp, U. Siart, Ch. Chwala, H. Kunstmann, and T. Eibert: "Rainfall Noise Modeling for Sensing the Atmosphere by Microwaves". In: *European Geoscience Union General Assembly (EGU)*. Vienna, Austria, April 3–8, 2011.
- [88] A. Ott, U. Siart, T. Eibert, O. Klemp, and R. Steffen: "Enhanced Investigations of 433 MHz–10 GHz Time Invariant Wireless In-Car Communication Channels". In: *German Microwave Conference (GeMiC)*. Darmstadt, Germany, March 14–16, 2011.
- [89] Ch. Chwala, H. Kunstmann, W. Qiu, S. Hipp, U. Siart, J. Seltmann, M. Pohl, A. Bradt, and J. Fritz: "Using Microwave Transmission for Line Integrated Precipitation and Humidity Observation". In: *12th URSI Commission-F Triennial Open Symposium on Radio Wave Propagation and Remote Sensing*. Garmisch-Partenkirchen, Germany, March 8–11, 2011.
- [90] S. Hipp, U. Siart, Ch. Chwala, T. Eibert, and H. Kunstmann: "Doppler Noise Modeling for Rain-Rate Observation by Ground-Based Transmission Measurement". In: *12th URSI Commission-F Triennial Open Symposium on Radio Wave Propagation and Remote Sensing*. Garmisch-Partenkirchen, Germany, March 8–11, 2011.
- [91] Ch. Chwala, U. Siart, S. Hipp, T. Eibert, and H. Kunstmann: "Point-to-Point Link Atmospheric Transmission Measurements for Precipitation Quantification". In: *Kleinheubacher Tagung*. Miltenberg, Germany, October 4–6, 2010.
- [92] S. Hipp, U. Siart, Ch. Chwala, T. Eibert, and H. Kunstmann: "Modelling of Electromagnetic Scattering in Rain Fields for Precipitation Quantification". In: *Kleinheubacher Tagung*. Miltenberg, Germany, October 4–6, 2010.
- [93] A. Ott, M. Shalaby, T. Eibert, U. Siart, E. Kaliyaperumal, J. Engelbrecht, and R. Collmann: "Performance Analysis of a Low Cost Wireless Indoor Positioning System with Distributed Antennas". In: *Kleinheubacher Tagung*. Miltenberg, Germany, October 4–6, 2010.
- [94] Ch. Chwala, U. Siart, S. Hipp, T. Eibert, and H. Kunstmann: "Dual-Band Polarimetric Coherent Atmospheric Transmission Experiment for Precipitation Observation". In: *Proc. 40th European Microwave Conference*. Paris, France, September 28–30, 2010.
- [95] J. E. E. Seltmann, H. Kunstmann, Ch. Chwala, W. Qiu, S. Hipp, U. Siart, M. Pohl, H. Messer-Yaron, P. Alpert, A. Bradt, and J. Fritz: "PROCEMA: A Virtual Institute to Measure Precipitation Combining Mobile Phone Transmission and Radar". In: *Proc. 6th European Conference on Radar in Meteorology and Hydrology (ERAD)*. Sibiu, Romania, September 6–10, 2010.
- [96] J. Detlefsen und U. Siart: *Grundlagen der Hochfrequenztechnik*. 3. Aufl. München: Oldenbourg, 2009.
- [97] S. Hipp, Ch. Chwala, U. Siart, T. Eibert, and H. Kunstmann: "Atmospheric Transmission Measurements for Precipitation Quantification". In: *Fachtagung des ITG-Fachausschusses 7.5, WFMN 2009*. Chemnitz, Germany, November 25–27, 2009.
- [98] S. Hipp, U. Siart, and P. Russer: "Electromagnetic Simulation of Electrically Large Scenarios Using the Incoherent Transmission Line Method: Theory and Application". In: *Proc. 39th European Microwave Conference*. Rome, Italy, September 28–October 2, 2009.
- [99] Y. Kuznetsov, A. Baev, T. Shevgunov, U. Siart, H. Yordanov, and P. Russer: "Generation of Network Models for Planar Microwave Circuits by System Identification Methods". In: *International Conference on Electromagnetics in Advanced Applications (ICEAA)*. Torino, Italy, September 14–18, 2009.

- [100] S. Hipp, U. Siart, N. Fichtner, and P. Russer: “Electromagnetic Simulation of Electrically Large Scenarios using an Incoherent Transmission Line Matrix (ITLM) Approach”. In: *The 25th International Review of Progress in Applied Computational Electromagnetics*. Monterey, California, USA, March 8–12, 2009.
- [101] S. Wane, D. Bajon, P. Russer, Y. Kuznetsov, N. Fichtner, and U. Siart: “Passive Guaranteed Broadband Equivalent Circuit Derivation of Symmetrical Multi-port Systems: Application to Multi-conductors and RF-Inductors”. In: *The 25th International Review of Progress in Applied Computational Electromagnetics*. Monterey, California, USA, March 8–12, 2009.
- [102] P. Russer, U. Siart, S. Hipp, and N. Fichtner: “Time-Domain Full-Wave Modeling of Electromagnetic Structures in Automotive Systems”. In: *20th International Zurich Symposium on Electromagnetic Compatibility, WS-5 Electromagnetic Modeling of Distributed Automotive Systems*. Zurich, Switzerland, January 12–16, 2009.
- [103] B. Biscontini, U. Siart, and P. Russer: “On the Modeling of Ultra Wide Band (UWB) Radiating Structures”. In: *Time-Domain Methods for Electromagnetic Field Modelling*. Ed. by P. Russer and U. Siart. Vol. 121. Springer Proceedings in Physics. Berlin: Springer, 2008, pp. 333–343.
- [104] K. Fichtner, U. Siart, Y. Kuznetsov, A. Baev, and P. Russer: “Bandwidth Optimization Using Transmission Line Matrix Modeling”. In: *Time-Domain Methods for Electromagnetic Field Modelling*. Ed. by P. Russer and U. Siart. Vol. 121. Springer Proceedings in Physics. Berlin: Springer, 2008, pp. 147–171.
- [105] U. Siart, S. Hofmann, N. Fichtner, and P. Russer: “Computation of Frequency Average Power Density Based on the TLM Method”. In: *Proc. 38th European Microwave Conference*. Amsterdam, October 27–31, 2008.
- [106] M. Zedler, S. Hofmann, U. Siart, and P. Russer: “Topological Description of Metamaterials”. In: *Proc. 2nd Int. Congress on Advanced Electromagnetic Materials in Microwaves and Optics (Metamaterials 2008)*. Pamplona, Spain, September 21–26, 2008.
- [107] Ch. Ullrich, U. Siart, and P. Russer: “Influence of a Metallic Turntable on Automotive Antenna Pattern Measurements”. In: *2008 URSI General Assembly*. Chicago, Illinois, USA, August 7–16, 2008.
- [108] M. Zedler, U. Siart, and P. Russer: “Circuit Theory Unifying Description for Metamaterials”. In: *2008 URSI General Assembly*. Chicago, Illinois, USA, August 7–16, 2008.
- [109] U. Siart, S. Hofmann, N. Fichtner, and P. Russer: “Coverage Prediction in Large Scenarios Based on the TLM Method”. In: *IEEE AP-S International Symposium on Antennas and Propagation*. San Diego, California, USA, July 5–12, 2008.
- [110] N. Fichtner, U. Siart, Y. Kuznetsov, A. Baev, and P. Russer: “TLM modeling and system identification of optimized antenna structures”. In: *Advances in Radio Science* 6 (May 26, 2008), pp. 45–48. DOI: 10.5194/ars-6-45-2008. URL: <http://www.adv-radio-sci.net/6/45/2008/> (visited on 05/22/2013).
- [111] U. Siart, K. Fichtner, Y. Kuznetsov, A. Baev, and P. Russer: “TLM Modeling and System Identification of Distributed Microwave Circuits and Antennas”. In: *International Conference on Electromagnetics in Advanced Applications (ICEAA)*. Torino, Italy, September 17–21, 2007.
- [112] N. Fichtner, U. Siart, and P. Russer: “Antenna Bandwidth Optimization Using Transmission Line Matrix Modeling and Genetic Algorithms”. In: *International Symposium on Signals, Systems, and Electronics (ISSSE)*. Québec, Canada, July 30–August 2, 2007.
- [113] J. Detlefsen und U. Siart: *Grundlagen der Hochfrequenztechnik*. 2. Aufl. München: Oldenbourg, 2006.
- [114] U. Siart and P. Russer: “Electromagnetic Characterization of Newly Developed Multilayered Car Body Parts”. In: *Mediterranean Microwave Symposium*. Genova, Italy, September 18–21, 2006, pp. 431–434.
- [115] S. Tejero, U. Siart, and J. Detlefsen: “Coherent and Non-Coherent Processing of Multiband Radar Sensor Data”. In: *Advances in Radio Science* 4 (September 4, 2006), pp. 73–78. DOI: 10.5194/ars-4-73-2006. URL: <http://www.adv-radio-sci.net/4/73/2006/> (visited on 05/22/2013).

- [116] U. Siart and P. Russer: "Dielectric Properties of Car Body Parts". In: *Workshop Quality of Automotive RF Systems, IEEE MTT-S International Microwave Symposium*. San Francisco (CA), USA, June 11–16, 2006.
- [117] U. Siart: *Modellgestützte Signalverarbeitung für inkohärente Radarsensoren in mehreren Frequenzbändern*. Dissertation. Berlin: Logos-Verlag, 2005.
- [118] U. Siart, B. Biscontini, P. Lorenz, and P. Russer: "Ultra-Wide-Band Antenna Design". In: *Radio Techniques and Technologies for Commercial Communication and Sensing Applications (RadioTecC)*. Berlin, October 2005.
- [119] S. Tejero, U. Siart, and J. Detlefsen: "Coherent and Non-Coherent Processing of Multiband Radar Sensor Data". In: *Kleinheubacher Tagung*. Miltenberg, Germany, September 26–30, 2005.
- [120] U. Siart, S. Tejero, and J. Detlefsen: "Exponential Modelling for Mutual-Cohering of Subband Radar Data". In: *Advances in Radio Science* 3 (May 12, 2005), pp. 199–204. DOI: 10.5194/ars-3-199-2005. URL: <http://www.adv-radio-sci.net/3/199/2005/> (visited on 05/22/2013).
- [121] U. Siart, S. Tejero, and J. Detlefsen: "Cramér-Rao-Bound for Coherent Dual-Band Radar Range Estimation". In: *Proc. German Microwave Conference GeMiC*. Ulm, Germany, April 5–7, 2005.
- [122] U. Siart and S. Tejero: "UTD Modelling of Radar Scenes for Coherent Multiband Processing". In: *Fields, Networks, Computational Methods, and Systems in Modern Electrodynamics*. Ed. by P. Russer and M. Mongiardo. Springer Proceedings in Physics. Berlin: Springer, 2004, pp. 263–270.
- [123] V. Winkler, J. Detlefsen, U. Siart, J. Büchler, and M. Wagner: "Automotive Radar Sensor with Communication Capability". In: *34th European Microwave Conference EuMC 2004*. Amsterdam, The Netherlands, October 12–14, 2004, pp. 305–308.
- [124] V. Winkler, J. Detlefsen, U. Siart, J. Büchler, and M. Wagner: "FPGA-based Signal Processing of an Automotive Radar Sensor". In: *European Radar Conference EuRAD 2004*. Amsterdam, The Netherlands, October 12–14, 2004, pp. 245–248.
- [125] V. Winkler, J. Detlefsen, U. Siart, J. Büchler, and M. Wagner: "Automotive Radar Sensor with Integrated Communication Capabilities". In: *Kleinheubacher Tagung*. Miltenberg, Germany, September 27–October 1, 2004.
- [126] U. Siart, S. Tejero, and J. Detlefsen: "Resolution Properties of Spectral Estimators Applied to Multiple Frequency Bands". In: *International Symposium on Signals, Systems, and Electronics ISSSE*. Linz, Austria, August 10–13, 2004.
- [127] U. Siart, S. Tejero und J. Detlefsen: „Kohärente Zweibandsensorik für Radaranwendungen“. In: *Workshop der URSI-Kommission B*. Günzburg, 8.–9. März 2004.
- [128] U. Siart und J. Detlefsen: „Funkortung und Funknavigation“. In: *Radar und Kommunikation RADCOM*. Hamburg-Harburg, 18. Februar 2004.
- [129] J. Büchler, J. Detlefsen, U. Siart, M. Wagner, and V. Winkler: *Radar System Comprising Integrated Data Transmission*. Europäisches Patent EP1567885. 2003.
- [130] J. Detlefsen und U. Siart: *Grundlagen der Hochfrequenztechnik*. München: Oldenbourg, 2003.
- [131] U. Siart, S. Tejero, and J. Detlefsen: "Concepts for Coherent Processing of Multiple Radar Sensor Signals". In: *Workshop WS11 Europ. Microwave Week 2003*. Munich, Germany, October 6–10, 2003.
- [132] U. Siart, S. Tejero, and J. Detlefsen: "Improving Range Resolution by Coherent Subband Processing of Multiple Radar Sensor Data". In: *International Radar Symposium (IRS)*. Dresden, Germany, September 30–October 2, 2003, pp. 101–104.
- [133] M. Wagner, J. Dickmann, J. Büchler, V. Winkler, U. Siart, and J. Detlefsen: "Radar Based IVC System". In: *Proc. SAE 2003 World Congress*. Detroit, Michigan, March 3–6, 2003.

- [134] M. Wagner, J. Büchler, J. Detlefsen, V. Winkler und U. Siart: *Gleichzeitige Kommunikation und Sensierung über Radarsysteme*. Deutsches Patent. 2002.
- [135] M. Wagner, J. Büchler, J. Detlefsen, V. Winkler und U. Siart: *Radarsystem mit integrierter Datenübertragung*. Deutsches Patent 10256620.8-35. 2002.
- [136] U. Siart and J. Detlefsen: "Efficient Modelling of Doppler Signals from Moving Rough Surfaces in the Millimeter-Wave Range". In: *German Radar Symposium (GRS)*. Bonn, Germany, September 3–5, 2002, pp. 365–368.
- [137] S. Tejero, U. Siart, and J. Detlefsen: "Modeling and Processing of Multiband Radar Sensor Data". In: *German Radar Symposium (GRS)*. Bonn, Germany, September 3–5, 2002, pp. 491–495.
- [138] H. P. Groll, J. Detlefsen, and U. Siart: "Multi-Sensor-Systems at mm-Wave Range for Automotive Applications". In: *Proc. Int. Conf. on Radar CIE*. Peking, China, October 16–18, 2001, pp. 150–153.
- [139] U. Siart und J. Detlefsen: „Systemkonzept eines multifunktionalen Mikrowellensensors für Kraftfahrzeuge“. In: *Kleinheubacher Berichte*. Bd. 41. 1998, S. 418–423.
- [140] U. Siart and J. Detlefsen: "Doppler Simulator for a Dual Frequency Radar over Rough Surfaces". In: *International Radar Symposium (IRS)*. Munich, Germany, September 15–17, 1998, pp. 371–377.
- [141] T. Geist and U. Siart: "Diplexing Millimeter Waves". In: *International Journal of Infrared and Millimeter Waves* 19.7 (July 1998), pp. 957–962.
- [142] U. Siart and J. Detlefsen: "Doppler Simulator for a Dual Frequency Near-Range CW-Radar". In: *Progress In Electromagnetics Research Symposium (PIERS)*. Nantes, France, July 13–17, 1998.
- [143] U. Siart, J. Detlefsen, M. Wollitzer, G. Wanielik, A. Schreck, and J. Büchler: "Modulation Technique and Data Acquisition in a Multifunctional Polarimetric Near Range Radar Sensor". In: *Progress In Electromagnetics Research Symposium (PIERS)*. Nantes, France, July 13–17, 1998.
- [144] M. Wollitzer, J. Büchler, J.-F. Luy, U. Siart, E. Schmidhammer, and J. Detlefsen: "Multifunctional Radar Sensor for Automotive Application". In: *IEEE Trans. Microw. Theory Techn.* MTT-46.5 (May 1998), pp. 701–708.
- [145] M. Wollitzer, J. Büchler, J.-F. Luy, U. Siart, and J. Detlefsen: "Multifunctional Radar Sensor for Vehicle Dynamics Control Systems". In: *2nd International Conference – Advanced Microsystems for Automotive Applications (AMAA)*. Berlin, Germany, March 26–27, 1998.
- [146] U. Siart and J. Detlefsen: "Multifunctional Near Range Radar for Automotive Application". In: *5th Scientific Students Exchange Seminar*. Technische Universität München, Moscow State Aviation Institute, September 1997.
- [147] H. Brand, J. Brune, and U. Siart: "Microwave Design Criteria for Quasi-Optical Terahertz Mixers". In: *International Workshop on Terahertz Electronics*. Zermatt, Switzerland, September 1995.