

Riana Helena Geschke

Contact details

Departmental address: Department of Electronic and Electrical Engineering, Room E414, University of Stellenbosch

Phone: +27 21 808 4452/5

Email: hansmann@sun.ac.za

Summary of Qualifications

| | |
|------|---|
| 2004 | PhD in Electronic Engineering, University of Stellenbosch |
| 1999 | MSc Eng, cum laude, University of Stellenbosch |
| 1996 | B Eng (Electric and Electronic) University of Stellenbosch |
| 1992 | Matriculation with A aggregate, Parel Vallei High School, Somerset West |

Employment History

| | |
|-------------|--|
| 2009- | Senior Lecturer at the Electrical and Electronic Engineering Department, University of Stellenbosch |
| 2003 - 2008 | Lecturer at the Electrical and Electronic Engineering Department, University of Stellenbosch |
| 2001, 2002 | Lecturer with the DoC Postgraduate Diploma in Engineering Program (hosted by the E&E Department, University of Stellenbosch) |
| 2000 | Part-time lecturer at the Electrical and Electronic Engineering Department, while doing PhD research |

National and International Contributions

Union Radio-Scientifique Internationale (URSI) Commission E- Electromagnetic Environment and Interference, South Africa chairperson for 2008-2009

Alternate for the chairperson of URSI SA Commission E, from 2005-2007

Editor for the SA IEEE AP/MTT conference held in Stellenbosch 2007 and 2009.

Programme committee member (2005-2008) for the IASTED International Conference on Antennas, Radar, and Wave propagation presented in Banff, Canada

Reviewer for IEEE Transactions on Antennas and Propagation

UNDERGRADUATE AND POSTGRADUATE TEACHING

- My experience ranges from working with small postgraduate groups to very large classes of young students. I have been involved with teaching of:

Electronics 245 2008,2009

Systems and Signals 214 2007- 2009

Electro-techniques 114/143, 2003 – 2006

Postgraduate High Frequency Measurement Course, with Prof PW van der Walt, 2004

Department of Communication Postgraduate Diploma: Wireless Communications, 2004

Department of Communication Postgraduate Diploma: Engineering Electromagnetics, 2001-2002

Department of Communication Postgraduate Diploma: Electromagnetic Compatibility, 2001-2002

- I am the Faculty of Engineering Student Council's honorary president for 2008, 2009
- In 2008, I was nominated as the Electrical and Electronic Engineering department's candidate for the Rector's Award for Excellence in Teaching.

RESEARCH

Research Interests

Compact Resonator Design for Microwave Filters using Metamaterial Elements

Metamaterials are periodic constructed structures ($< \lambda/4$) with specific properties. This field of research includes both theoretical studies and very useful practical work and applications. I am currently working on intriguing applications of these structures to the design of small microwave filters.

Electromagnetic Compatibility (EMC): EMC problems such as electromagnetic shielding, cable tray shielding, the generation and suppression of parasitic modes on printed circuit boards and the design of miniature magnetic field probes fall within the scope of my research activities.

Computational Electromagnetics: My master's degree research focused on vector finite elements for eigenvalue problems. In my PhD research I implemented a novel hybrid integral-equation/vector finite element method formulation applicable to inhomogeneous obstacle scattering in hollow waveguide.

PUBLICATIONS 2003-2009

RH GESCHKE. *Application of an extended Huygens' Principle to Scattering Discontinuities in Waveguide*. PhD dissertation, 2004. 69 pp. Promoters: Davidson DB, Meyer P, Ferrari R.L.

Papers in Refereed Journals

E LAUBSCHER and RH GESCHKE. *A novel Uniplanar Electromagnetic Bandgap Unit Cell Design with Reduced Spurious Radiation*. **SAIEE Africa Research Journal**, September 2008.

NW EBERTSOHN, RH GESCHKE and HC READER. *Cable Trays in EMC: Measurement and Modeling to 30 MHz*. **IEEE Transactions on Electromagnetic Compatibility**, vol. 49, no. 2, May 2007.

RH GESCHKE, RL FERRARI, DB DAVIDSON and P MEYER. *The solution of Waveguide Scattering Problems by Application of Extended Huygens Formulation*. **IEEE Transactions on Microwave Theory and Techniques**, vol. 54, no. 10, October 2006.

RH GESCHKE, RL FERRARI, DB DAVIDSON and P MEYER. Application of extended Huygens' Principle to scattering discontinuities in waveguide. **Transactions of the South African Institute of Electrical Engineers**, 2003; 94(2) : 28-31.

Presentations at International Symposia

HC READER, PG Wiid and RH GESCHKE, *Developments in EMC computational and scale modelling of Square Kilometre Array Demonstrator*, **European Space Agency Workshop on Aerospace EMC, 30 March – 1 April 2009, Florence, Italy**.

RH GESCHKE and E LAUBSCHER, *An Optimized Planar EBG Unit Cell for MHz to GHz Range Applications*, **NATO Advanced Research Workshop: Metamaterials for Secure Information and Communication Technologies**, 7-10 May, 2008, Marrakech, Morocco.

HC READER, RH GESCHKE, PG WIID, PS van der MERWE, RG URBAN, DJ ROSSOUW, *Issues in EMC metrology and modelling for Square Kilometre Array Demonstrator*, **2008 URSI XXIX General Assembly, Chicago**, Illinois, USA, August 7-16, 2008, on conference CD under session AE: EMC Measurements.

E LAUBSCHER and RH GESCHKE, *Electromagnetic Bandgap Structures for Printed Circuit Board EMC*, **IEEE AFRICON 2007**, 26-28 September 2007 in **Windhoek**, Namibia.

RH GESCHKE, RL FERRARI, DB DAVIDSON and P MEYER. *Application of Extended Huygens' Principle to Dielectric Posts in Waveguide*. **The IASTED International Conference on Antennas, Radar and Wave Propagation**, Banff, Canada, IASTED - Acta Press (ISBN: 0-88986-416-0) 2004: 4.

SM BRADSHAW, TV CHOW TING CHAN, HC READER, RH GESCHKE, SA KINGMAN, K JACKSON. *Quantifying Applicator Design for Microwave Assisted Comminution*. **10th International Conference on Microwave and HF Heating**, Loughborough University, **Loughborough**, United Kingdom, Loughborough University 2003: 4.

National Symposia

RH GESCHKE, B JOKANOVIC, P MEYER. *Split-ring Resonators for Compact Filters*, **All invited papers, SA-IEEE AP/MTT conference**, 30-31 March 2009, Stellenbosch, South Africa.

PG WIID, HC READER and RH GESCHKE. *Scale Modelling and Measurement of Karoo Array Telescope Structure: Lightning and Earthing*, **The 18th Southern African Universities Power Engineering Conference (SAUPEC)**, January 2009.

PG WIID, HC READER and RH GESCHKE. *RFI Characterisation of Karoo Array Telescope Structure*. **South African SKA/MeerKAT Project, 3rd annual Postgraduate Bursary Conference**, Stellenbosch, Dec 2008, presentations available on SKA website: www.ska.ac.za. *PG Wiid won best overall engineering presentation award for his presentation.*

HC READER, RH GESCHKE, PS van der MERWE, DJ ROSSOUW. *Transfer Impedance and EM Bandgap Structures in EMI Suppression*. **SAUPEC 2008, Proc. 17th Southern African Univ. Power Eng. Conf, January 2008, on CD-ROM.**

PG WIID, H C READER and R H GESCHKE. *Method of Moments Modelling and Measurements in RFI Studies*, **South African SKA / MeerKAT Project, 2nd Annual Postgraduate Bursary Conference**, SA Astronomical Observatory, Cape Town, Nov 2007, presentations available on SKA website: www.ska.ac.za. *PG Wiid awarded best PhD presentation award.*

RH GESCHKE AND E LAUBSCHER. *Electromagnetic Bandgap Structures for EMC*. **All invited papers, SA-IEEE AP/MTT conference**, 26-27 March 2007, Stellenbosch, South Africa.

HC READER, J BADENHORST, RH GESCHKE, NW EBERTSOHN AND MD JANEZIC. *Transfer Impedance, EMI Sensors and HF Metrology*. **All invited papers, SA-IEEE AP/MTT conference**, 26-27 March 2007, Stellenbosch, South Africa.

HC READER, RH GESCHKE, J BADENHORST and E LAUBSCHER. *Issues in Calibrating Sensors for EMI and Suppression of Unwanted Modes*. **SAUPEC 2007**, Proc. 16th Southern African Univ. Power Eng. Conf, University of Cape Town, Cape Town, South Africa, January 2007, on CD-ROM

NW EBERTSOHN, RH GESCHKE and HC READER. *Cable tray transfer impedance measurement*. **SAUPEC 2006**, Proc. 15th Southern African Univ. Power Eng. Conf, University of Kwa-Zulu Natal, Durban, South Africa, January 2006, on CD-ROM

READER HC, URBAN RG, GESCHKE RH. *The One Eye and Two Ears of EMC: Metrology*. **All invited papers , 2005 South African IEEE AP/MTT Conference**, Technopark, Stellenbosch, South Africa, IEEE 2005: 6.

RH GESCHKE, RL FERRARI, DB DAVIDSON and P MEYER. *The solution of waveguide scattering problems by application of an extended Huygens principle*. **All invited papers , 2005 South African IEEE AP/MTT Conference**, Technopark, Stellenbosch, South Africa, 2005: 6.