Wireless Power Week 2019

Bringing together the two major wireless power events: IEEE MTT-S Wireless Power Transfer Conference (WPTC) and IEEE PELS Workshop on Emerging Technologies: Wireless Power (WoW)

Conference Co-Chairs:
Paul D. Mitcheson, Imperial College London
Hubregt J. Visser, Eindhoven University of Technology

Technical Program Committee Co-Chairs:
Grant A. Covic - The University of Auckland
David C. Yates - Imperial College London
Alessandra Costanzo - University of Bologna
Bart Smolders - Eindhoven University of Technology

WPW School Chair:
Nuno Carvalho - University of Aveiro, Portugal

Local Organising Committee Chairs:
Lingxin Lan - Imperial College London, UK
Juan Arteaga - Imperial College London, UK

The conference proceedings will be published in IEEEExplore, separately for WPTC and WoW
PROGRAM: WIRELESS POWER WEEK 2019

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Committees

Chairs

Paul D. Mitcheson
Imperial College London
(United Kingdom)

Hubregt J. Visser
Eindhoven University of Technology
(The Netherlands)

TPC Chairs

WPTC

Alessandra Costanzo
University of Bologna
(Italy)

Bart Smolders
Eindhoven University of Technology
(The Netherlands)

WoW

Grant Covic
University of Auckland
(New Zealand)

David Yates
Imperial College London
(United Kingdom)
TPC Members
Juan Arteaga, Imperial College London (United Kingdom)
Alessandra Costanzo, University of Bologna (Italy)
Grant Covic, University of Auckland (New Zealand)
Lingxin Lan, Imperial College London (United Kingdom)
Bart Smolders, Eindhoven University of Technology (The Netherlands)
Hubregt Visser, Eindhoven University of Technology (The Netherlands)
David Yates, Imperial College London (United Kingdom)
Jesus Acero, University of Zaragoza (Spain)
Seungyoung Ahn, Korea Advanced Institute of Science and Technology (South Korea)
Federico Alimenti, University of Perugia (Italy)
David Arnold, University of Florida (United States of America)
Al Thaddeus Avestruz, University of Michigan (United States of America)
Ikuo Awai, Ryutech Corporation (Thailand)
Damienne Bajon, ISAE - Université de Toulouse (France)
Stephen Beeby, University of Southampton (United Kingdom)
Djuradj Budimir, University of Westminster (United Kingdom)
Steve Burrow, University of Bristol (United Kingdom)
Nuno Carvalho, University of Aveiro / IT Aveiro (Portugal)
Jung-Chih Chiao, The University of Texas at Arlington (United States of America)
Dong-Ho Cho, Korea Advanced Institute of Science and Technology (South Korea)
Bruno Clerckx, Imperial College London (United Kingdom)
Marco Dionigi, University of Perugia (Italy)
Simon Hemour, University of Bordeaux (France)
Aiguo Patrick Hu, University of Auckland (New Zealand)
Ron Hui, University of Hong Kong (Hong Kong)
Chi-Kwan Lee University of Hong Kong (Hong Kong)
Jenshan Lin, University of Florida (United States of America)
Chengbin Ma, Shanghai Jia Tong University (China)
Udaya Madawala, University of Auckland (New Zealand)
Diego Masotti, University of Bologna (Italy)
Richard McMahon, University of Warwick (United Kingdom)
Chris Mi, San Diego State University (United States of America)
Mauro Mongiardo, University of Perugia (Italy)
Giuseppina Monti, University of Salento (Italy)
Amir Mortazawi, University of Michigan (United States of America)
Kenjiro Nishikawa, Kagoshima University (Japan)
Young-Jin Park, KERI & UST (South Korea)
Volker Pickert, Newcastle University (United Kingdom)
Zbynek Raida, Brno University of Technology (Czech Republic)
Juan Rivas-Davila, Stanford University (United States of America)
Luca Roselli, University of Perugia (Italy)
Dominique Schreurs, Katholieke Universiteit Leuven (Belgium)
Naoki Shinohara, Kyoto University (Japan)
Hiroki Shoki, Toshiba Corporation (Japan)
Nobby Stevens, Katholieke Universiteit Leuven (Belgium)
Alex Takacs, University of Toulouse (France)
Luciano Tarricone, University of Salento (Italy)
Duleepa Thrimawithana, University of Auckland (New Zealand)
Ke Wu, University of Montreal (Canada)
Seho Kim, University of Auckland (New Zealand)
Jackman Lin, University of Auckland (New Zealand)

Local Organising Committee
Lingxin Lan
Juan Arteaga
Tom Van Nunen
Junghoon Kim
Christopher Kwan
Ioannis Nikiforidis
Mahmoud Ouda
Nunzio Pucci
Chairs’ Welcome Message

On behalf of the organizing committee, it gives us enormous pleasure to welcome you to Wireless Power Week 2019 (WPW2019) at IET Savoy Place, London.

Wireless Power Week started in 2018 in Montreal, Canada, bringing together the IEEE MTT-S Wireless Power Transfer Conference (WPTC) and the IEEE PELS Workshop on Emerging Technologies: Wireless Power (WoW). This year, at the second edition of Wireless Power Week, we are happy to see an increase of over 30% in paper submissions, with 304 submissions in total. In total, 237 papers were accepted, giving an acceptance rate of 78%. There are 841 separate authors from 41 countries, of which 49% are from academia, 34% are students, 21% are from industry, 3% are from government, and 1% are from NGOs.

Wireless Power Transfer is a technology finding its way into products and so this year we have strived to make a strong connection between academia and industry. We see this reflected in the many contributions from industry and joint contributions from industry and academia. The technical program is led by 4 plenary talks, 2 joint-track invited talks, and 4 track-specific invited talks. The conference has both a WPTC/MTT track and a WoW/PELS track, but all tickets allow access to all sessions, so please feel free to roam between tracks as you wish.

We are delighted to enjoy the support from this year’s sponsors and exhibitors, and we hope you will make the most of the exhibition, which is co-located with the posters.

The highlight of the social program is the conference banquet, to be held on Thursday evening, in “Tesla’s Secret London Laboratory”. We are fortunate that the banquet falls on “Power Electronics Society Day” and are happy that PELS, MTT and other members of the WPW community can get together and network in what promises to be an interesting environment!

There are many people we wish to thank, who have put an enormous amount of time and effort into Wireless Power Week. The TPC, chaired by Alessandra Costanzo and Bart Smolders (WPTC) and Grant Covic and David Yates (WoW) have given valuable time shaping the technical program. Nuno Borges Carvalho chaired the WPW School, held on Monday at Imperial College London. The local organizing committee, chaired by Lingxin Lan and Juan Arteaga, have worked tirelessly to make the conference happen.

Thank you for joining us at WPW2019, and we hope you will have an enjoyable and productive conference and enjoy your stay in London.

Paul D. Mitcheson
Imperial College London

Hubregt J. Visser
Eindhoven University of Technology
General Information

Registration & Information Desk
The Registration and Information Desk will be open during the following times:

Monday 17th June 6pm – 10pm
Tuesday 18th June 8am – 5pm
Wednesday 19th June 8am – 5pm
Thursday 20th June 8am – 5pm
Friday 21st June 8am – 12:45pm

Meeting room Locations
Plenary Kelvin Lecture Theatre (Ground floor)
WPTC Kelvin Lecture Theatre
WoW Turing Lecture Theatre (Second floor)
Joint Invited Talks Kelvin Lecture Theatre
Posters Maxwell Library & Siemens Board Room (First floor)
Exhibitors Maxwell Library
Refreshments Maxwell Library & Siemens Board Room
Registration Desk Maxwell Library
Banquet Flowers Room (Ground floor)
Ivory House, “Tesla’s Secret Lab”

Name Badges
All attendees must wear their name badges at all times to gain admission to all conference events.

Electronic Proceedings
One copy of the Electronic Proceedings will be provided to you on a flash drive during registration.

Traveller’s Checks and Credit Cards
Credit cards, including MasterCard®, Visa® and American Express®, and traveller’s checks are accepted at most hotels, restaurants, and souvenir shops.

Tipping Standards
Tipping of 10-12.5% is standard for good service at restaurants with table service. Note that tipping and taxes are usually included in the bill. Tips are not expected in pubs when you are not dining.

Smoking
There is no smoking in Savoy Place and in “Tesla’s Secret Lab”. Smoking is forbidden by law in the UK in all public buildings, public transport and in taxis.

Mobile Phones
As a courtesy to your fellow attendees, please turn off your mobile phone ringer during the conference.

Food at the Venue
Please note that food bought outside cannot be brought into IET Savoy Place.
Local Area Map

Nearby Places to Eat:

1. Pret A Manger – Sandwiches
2. Caffè Nero – Coffee shop
3. Pizza Express – Pizza place
4. Starbucks – Coffee shop
5. Joe Allen – American food
6. Wasabi – Japanese Sushi and bento
7. Byron – Casual dining burger place
8. Costa Coffee – Coffee shop
9. Nando’s – South African style chicken dishes
10. Pizza Hut – Pizza place
11. Wagamama – Asian/ Japanese style cuisine
12. Barrafina – Spanish tapas
13. Chinatown (Many Chinese restaurants)

Tube Stations:

1. Embankment ~5 minutes walk
2. Temple Station ~5 minutes walk
3. Charing Cross Station ~7 minutes walk
4. Leicester Square ~11 minutes walk

Banquet: Tesla’s Lost London Laboratory:

Ivory House
St. Katharine’s dock
E1W 1AT

(Take the Circle/District line from Temple/Embankment Station to Tower Hill Station)
Posters & Exhibition room layout:
## Program: Wireless Power Week 2019

### Monday

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<td>Program</td>
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<tr>
<td>18:00-22:00</td>
<td>IET Savoy Place registration &amp; welcome reception</td>
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<td>08:00</td>
<td>Registration &amp; coffee</td>
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<tr>
<td>08:25-08:55</td>
<td>Registration &amp; coffee</td>
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<tr>
<td>08:55</td>
<td>Welcome talk</td>
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<tr>
<td>09:55</td>
<td>Plenary talk 1 - Alex Gruzen (CEO of WiTricity) Wireless Charging: Driving EV Adoption and the Autonomous Future</td>
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<tr>
<td>09:45-11:15</td>
<td>WPTC session 1 Systems for Power and Data Transfer</td>
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<td>11:15-11:40</td>
<td>Coffee Break</td>
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<td>11:40-12:25</td>
<td>Registration &amp; coffee</td>
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<td>12:25-13:45</td>
<td>Lunch</td>
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<tr>
<td>13:45-14:10</td>
<td>Registration &amp; coffee</td>
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<tr>
<td>14:15-15:30</td>
<td>WPTC session 2 Novel Rectifier Solutions</td>
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<td>14:15-15:30</td>
<td>WoW session 2 System Characterisation</td>
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<tr>
<td>15:30-17:00</td>
<td>Poster session &amp; coffee</td>
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### Wednesday

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<tr>
<th>Time</th>
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<th>Program</th>
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<tr>
<td>08:00-08:25</td>
<td>Flowers Room</td>
<td>Registration &amp; Coffee</td>
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<td>08:25-09:55</td>
<td>Kelvin Lecture Theatre</td>
<td>WPTC session 3</td>
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<td>Wearable and Biomedical Systems</td>
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<td>08:25-09:55</td>
<td>Turing Lecture Theatre</td>
<td>WoW session 3</td>
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<td>Wearable and Biomedical Systems</td>
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<tr>
<td>10:00-10:45</td>
<td>Kelvin Lecture Theatre</td>
<td>Plenary talk 3 - Mirko de Melis (Lead Scientist EMEA - Medtronic)</td>
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<td></td>
<td>Advances in Wireless Power Transfer Technology &amp; Implanted Medical Devices</td>
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<tr>
<td>10:45-11:15</td>
<td>Maxwell Library &amp; Siemens Board Room</td>
<td>Coffee Break</td>
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<td>11:15-12:30</td>
<td>Kelvin Lecture Theatre</td>
<td>WPTC session 4</td>
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<td>Microwave Power Converters</td>
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<td>11:15-12:30</td>
<td>Turing Lecture Theatre</td>
<td>WoW session 4</td>
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<td>Auxiliary Systems and Emissions</td>
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<td>12:30-13:45</td>
<td>Lunch</td>
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<td>13:45-15:25</td>
<td>Kelvin Lecture Theatre</td>
<td>Invited talk – Hooman Kazemi (Raytheon, USA)</td>
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<td></td>
<td>Millimeter Wave Wireless Power Transmission-Technologies and Applications</td>
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<td>WPTC session 5</td>
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<td>Unconventional WPT Links</td>
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<td>13:45-15:25</td>
<td>Turing Lecture Theatre</td>
<td>Invited talk – Jürgen Meins (University of Braunschweig, Germany)</td>
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<tr>
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<td>Solution for simplified wireless Inductive Power Transfer</td>
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<td>WoW session 5</td>
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<td>Kelvin Lecture Theatre</td>
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<td>The future of WBG devices in power processing and wireless power</td>
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<tr>
<td>Time</td>
<td>Location</td>
<td>Sessions/Activities</td>
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<td>08:00-08:25</td>
<td>Flowers Room</td>
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<tr>
<td>08:25-09:55</td>
<td>Kelvin Lecture Theatre</td>
<td>WPTC session 6 Antenna Systems for WPT</td>
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<td>08:25-09:55</td>
<td>Turing Lecture Theatre</td>
<td>WoW session 6 Dynamic IPT</td>
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<td>09:55-10:25</td>
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<td>Coffee Break</td>
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<tr>
<td>10:25-11:55</td>
<td>Kelvin Lecture Theatre</td>
<td>WPTC session 7 Capacitive and Inductive WPT</td>
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<td>10:25-11:55</td>
<td>Turing Lecture Theatre</td>
<td>WoW session 7 High Frequency WPT</td>
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<tr>
<td>11:55-13:20</td>
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<tr>
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</tr>
<tr>
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<td>Turing Lecture Theatre</td>
<td>Invited talk – Burak Ozpineci (Oak Ridge National Laboratory, USA) Progress Towards Extreme Fast Wireless Static and Dynamic Charging WoW session 8 Converter Design &amp; Control</td>
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<tr>
<td>15:00-17:00</td>
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<td>Poster session 2 &amp; Coffee</td>
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<tr>
<td>18:00-22:00</td>
<td>Banquet</td>
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“Tesla’s Lost London Laboratory”
**PROGRAM: WIRELESS POWER WEEK 2019**

**Friday**

<table>
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<th>Time</th>
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<tr>
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<td>Flowers Room</td>
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<td>Registration &amp; Coffee</td>
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<td>08:25-09:45</td>
<td>Kelvin Lecture Theatre</td>
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<td><strong>WPTC &amp; WoW joint session 1</strong></td>
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<td>High Power and Ultrasonic WPT</td>
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<td>09:45-10:30</td>
<td>Kelvin Lecture Theatre</td>
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<td></td>
<td><strong>Plenary talk 4 - Irina Khromova (Head of Science and Technology - Metaboard Ltd)</strong></td>
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<td></td>
<td>Large-area wireless charging enabled by metamaterials</td>
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<tr>
<td>10:30-11:00</td>
<td>Maxwell Library &amp; Siemens Board Room</td>
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<td>Coffee Break</td>
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<td>11:00-12:10</td>
<td>Kelvin Lecture Theatre</td>
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<td></td>
<td><strong>WPTC &amp; WoW joint invited talk 2 – Dinesh Kithany (HIS Markit, United Kingdom)</strong></td>
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<td>Wireless power market set to evolve beyond mobile phones – Market overview</td>
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<tr>
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<td><strong>WPTC &amp; WoW joint session 2</strong></td>
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<tr>
<td></td>
<td>Moving WPT Systems</td>
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<tr>
<td>12:10-12:45</td>
<td>Kelvin Lecture Theatre</td>
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<td></td>
<td><strong>WPW2020 announcement &amp; Closing ceremony</strong></td>
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</tbody>
</table>
Tuesday 18 June

Registration and Opening

08:00 Registration & Coffee

08:25 Welcome Talk
Paul Mitcheson, Hubregt Visser

Plenary Talk 1
Kelvin Lecture Theatre
Chairs: Bart Smolders, Grant Covic

08:55 Wireless Charging: Driving EV Adoption and the Autonomous Future
Alex Gruzen
WiTricity, United States of America

09:40 Transit

WPTC Session 1 – Systems for Power and Data Transfer
Kelvin Lecture Theatre
Chairs: Bruno Clerckx, Luca Roselli

09:45 Experimental Analysis of Harvested Energy and Throughput Trade-Off in a Realistic SWIPT System
Junghoon Kim¹, Bruno Clerckx¹, Paul D. Mitcheson¹
¹Imperial College London, United Kingdom

10:00 Experimental Characterization of Narrowband Power Optimized Waveforms
Takashi Ikeuchi¹, Yoshihiro Kawahara¹, Joshua R. Smith²
¹University of Tokyo, Japan, ²University of Washington, United States of America

10:15 Power Allocation Method Using Pilot Signal for Simultaneous Transmission of Power and Information
Nam-I Kim¹, Dae geun Yang¹, Ju Yong Lee¹, Dong-Ho Cho¹
¹KAIST, South Korea

10:30 A New Wireless Power and Data Transmission Circuit for Cochlear Implants
Iman Abdali Mashhadi¹, Behzad Poorali¹, Majid Pahlevani¹
¹University of Calgary, Canada

10:45 Receiving ASK-OFDM in Low Power SWIPT Nodes without Local Oscillators
Steven Claessens¹, Ya Ting Chang¹, Dominique Schreurs¹, Sofie Pollin¹
¹University of Leuven, Belgium

11:00 A Wideband Efficient Rectifier Design for SWIPT
Ya Ting Chang¹, Steven Claessens¹, Sofie Pollin¹, Dominique Schreurs¹
¹University of Leuven, Belgium

WoW Session 1 – Magnetic Designs
Turing Lecture Theatre
PROGRAM: WIRELESS POWER WEEK 2019

Chairs: Jürgen Meins, Christopher Kwan

09:45  Optimising Ferrite-Less Pad Reflection Winding with a Multi-Objective Genetic Algorithm
Matthew G.S. Pearce¹, Michael J. O'Sullivan¹, Claudio Carretero², Grant A. Covic¹, John T. Boys¹
¹University of Auckland, New Zealand, ²University of Zaragoza, Spain

10:00  Evaluation of Soft Magnetic Composites for Inductive Wireless Power Transfer
Daniel Barth¹, Giuseppe Cortese², Thomas Leibfried¹
¹Karlsruhe Institute of Technology, Germany, ²Daimler AG, Germany

10:15  Avoiding Null Power Point in DD coils
Manuele Bertoluzzo¹, Giuseppe Buja¹, Hemant Dashora¹
¹University of Padova, Italy

10:30  A Dead-Angle-Free Omnidirectional Wireless Power Transfer
Bowen Zhang¹, Zhen Zhang¹, Hongliang Pang¹, Cong Xie¹, Xingyu Li¹, Lin Yang¹
¹Tianjin University, China

10:45  Misalignment Influence on Resonance Shielding in Wireless Power Transfer for Electric Vehicles
Myrel Alsayegh¹, Markus Clemens¹, Benedikt Schmuelling¹
¹University of Wuppertal, Germany

11:00  Reduction of the Shielding Effect on the Coupling Factor of an EV WPT System
Karim Kadem¹, Yann Le Bihan¹, Mohamed Bensetti¹, Éric Laboure¹, Antoine Diet¹, Mustapha Debbou²
¹Sorbonne Université, France, ²Vedecom, France

Coffee Break

11:15  Coffee Break

Plenary Talk 2
Kelvin Lecture Theatre
Chairs: Alessandra Costanzo, David Yates

11:40  Market & Future of Global Wireless Power Transfer Industry
Alexander Gerfer
Würth Elektronik, Germany

Lunch

12:25  Lunch

Joint Invited Talk 1
Kelvin Lecture Theatre
Chairs: Ron Hui, Nuno Carvalho

13:45  Moving to a World without Wires
Paul Wiener
GaN Systems, United States of America

14:10  Transit
WPTC Session 2 – Novel Rectifier Solutions
Kelvin Lecture Theatre
Chairs: Nuno Carvalho, Pedram Mousawi

14:15 Input Impedance Calculation of a Multi-Stage Rectifier Circuit
Hubregt Visser¹, Hans Pflug², Shady Keyrouz³
¹imec, Netherlands, ²GTX Medical, Netherlands, ³Antenna Company, Netherlands

14:30 GaN Schottky Barrier Diode for Sub-Terahertz Rectenna
Sei Mizojiri¹, Kengo Takagi¹, Kohei Shimamura¹, Shigeru Yokota¹, Masafunari Fukunari², Yoshinori Tatematsu², Teruo Saito²
¹University of Tsukuba, Japan, ²University of Fukui, Japan

14:45 Design of High Voltage Output for CMOS Voltage Rectifier for Energy Harvesting Design
Jefferson A. Hora¹, Eryk Dutkiewicz¹, Xi Zhu¹
¹University of Technology Sydney, Australia

15:00 Wide Dynamic Range Rectifier Circuit with Varactor Tuning Technique
Ayako Suzuki¹, Koshi Hamano¹, Hayato Shimizu¹, Hiroshi Okazaki¹, Yasunori Suzuki², Kunihiro Kawai¹, Atushi Fukuda¹, Kenjiro Nishikawa¹
¹Kagoshima University, Japan, ²NTT Docomo, Inc., Japan

15:15 2.4 GHz CMOS Design RF-to-DC Energy harvesting with Charge Control System for WSN Application
Jefferson A. Hora¹, Eryk Dutkiewicz¹, Xi Zhu¹
¹University of Technology Sydney, Australia

WoW Session 2 – System Characterisation
Turing Lecture Theatre
Chairs: Ron Hui, Patrick Hu

14:15 Optimal Excitation of Multi-transmitter Wireless Power Transfer System without Receiver Sensors
Prasad Jayathurathnage¹, Fu Liu¹
¹Aalto University, Finland

14:30 Loss Shifted Design of Transcutaneous Energy Transfer Systems
Alexander Enssle¹, Lukas Elbracht¹, Nejila Parspour¹, Marco Zimmer¹, Joerg Heinrich¹
¹University of Stuttgart, Germany

14:45 Measuring the Q-factor of IPT Magnetic Couplers
Gaurav R. Kalra¹, Matthew G. S. Pearce¹, Seho Kim¹, Duleepa J. Thrimawithana¹, Grant A. Covic¹
¹University of Auckland, New Zealand

15:00 Impedance Measurement on Inductive Power Transfer Systems
Marius Hassler¹, Oguz Atasoy², Morris Kesler², Karl Twelker², Tobias Achatz³, Markus Jetz³, Josef Krammer³
¹BMW Group, Germany, ²WiTricity Corporation, United States of America, ³Zollner Elektronik AG, Germany

15:15 A Reflected Impedance Estimation Technique for Inductive Power Transfer
Lingxin Lan¹, Juan M. Arteaga¹, David C. Yates¹, Paul D. Mitcheson¹
¹Imperial College London, United Kingdom
Poster Session I and Coffee Break

15:30 – 17:00 Poster Session I – WPTC
Chair: Diego Masotti

WPTC-P1 - Near-Field Links
Maxwell Library

WPP1  
Design of Coil Turn Ratios to Achieve Extensive Load Range and High Efficiency in Wireless Power Transfer System  
Heng-Ming Hsu¹, Yu-Fu Liu¹, Jian-Kai Liao¹, Pang Yu Liu¹  
¹National Chung Hsing University, Taiwan

WPP2  
Using Metallic Coil to Optimize the Heating Efficiency for Tumor Hyperthermia  
Guoxiong Chen¹, Chenxi Wang¹, Yuhua Cheng¹, Gaofeng Wang¹  
¹Hangzhou Dianzi University, China

WPP3  
Virtual Impedance Control for Efficient Power Transfer in Electromagnetic Levitation Melting System  
Moria Elkayam¹, Yotam Frechter¹, Idan Sassonker¹, Alon Kuperman¹  
¹Ben-Gurion University of the Negev, Israel

WPP4  
High Q-factor Coil with Transistorized Negative Impedance Converter for Mobile Applications  
Tae-Hyung Kim¹, Gi-Ho Yun², Jong-Gwan Yook¹  
¹Yonsei University, South Korea, ²Sungkyul University, South Korea

WPP5  
Global Optimization Design of Inductively Coupled Power Transfer System Parameter  
Qiang Bo¹,², Lifang Wang¹,², Tao Chengxuan¹  
¹Institute of Electrical Engineering Chinese Academy of Sciences, China, ²University of Chinese Academy of Sciences, China, ³Beijing Co-Innovation Center for Electric Vehicles, China

WPP6  
Modeling of Magnetic Coupled Coil for Wireless Power Transfer in Conductive Medium  
Jongwook Kim¹, Haerim Kim¹, Dongwook Kim¹, Yujun Shin¹, Chanjun Park¹, Seungyoung Ahn¹  
¹KAIST, South Korea

WPP7  
A Design Procedure for CPT System with LCL Resonant Network  
Hongfei Xia¹, Huanhuan Wu¹, Yuhua Cheng¹, Gaofeng Wang¹  
¹Hangzhou Dianzi University, China

WPP8  
85-kHz band 450-W Inductive Power Transfer for Unmanned Aerial Vehicle Wireless Charging Port  
Shuichi Obayashi¹, Yasuhiro Kanekiya¹, Kouju Nishizawa², Hiroaki Kusada²  
¹Toshiba Corporation, Japan, ²Tepco Research Institute, Japan

WPP9  
Design of Free-Positioning Wireless Power Transfer using A Half-Rectangular Prism Transmitting Coil  
Nam Ha-Van¹, Hoang Le-Huu¹, Chulhun Seo¹  
¹Soongsil University, South Korea

WPP10  
Wireless Power Transfer System Using Sub-Wavelength Toroidal Magnetic Metamaterials  
Yuqian Wang¹, Xu Chen¹, Yewen Zhang¹, Kai Fang¹, Yong Sun¹, Yunhui Li¹, Hong Chen¹  
¹Tongli University, China
WPP11  Design of Magnetic Shielding Structure for Wireless Charging Coupler  
Heqi Xu¹, Houji Li¹, Chunfang Wang¹  
¹Qingdao University, China

WPP12  Study on Series Printed-Circuit-Board Coil Matrix for Misalignment-Insensitive Wireless Charging  
Jianchao Li¹, Liming Wang¹, Fanghui Yin¹  
¹Tsinghua University, China

WPP13  An Efficiency Optimization Strategy in a Wireless Power Transfer Device Under Seawater  
Wei Gao¹, Jingjing Jiang¹, Jianxin Gao¹, Da Li¹  
¹Naval University of Engineering, China, ²Central Hospital in Wuhan, China

WPP14  Optimal Coil Design for Wireless powering of Biomedical Implants Considering Safety Constraints  
Erik Andersen¹, Binh Duc Truong¹, Shad Roundy¹  
¹University of Utah, United States of America

WPP15  Wireless Power Transfer System whose Input / Output Ratio is Determined Only by Self-Inductance  
Kenji Nara¹, Naofumi Madoiwa², Yasuyoshi Kaneko¹  
¹Saitama University, Japan, ²Tokyo Institute of Technology, Japan

WPP16  Alternative Configuration of Open-Bifilar Coil for Self-Resonant Wireless Power Transfer System  
Caio M. de Miranda¹, Sérgio F. Pichorim¹  
¹Federal University of Technology, Brazil

WPP17  AC Loss Behavior of Wireless Power Transfer Coils  
Christoph Utschick¹, Christian Merz¹, Cem Som¹  
¹Würth Elektronik eiSos GmbH & Co. KG, Germany

WPP18  Investigation of Magnetic Field Shielding by Mesh Aluminum Sheet in Wireless Power Transfer System  
Cancan Rong¹, Xiong Tao¹, Conghui Lu¹, Minghai Liu¹  
¹Huazhong University of Science and Technology, China

WPP19  Efficiency Factor Calculation for Contactless Energy Transfer Systems  
Jörg Heinrich¹, Philipp Prag¹, Nejila Parspour¹, David Maier¹  
¹University of Stuttgart, Germany

WPP20  Current Distribution Analysis for Automatic Resonator Design in Wireless Power Transfer  
Yoshiaki Narusue¹, Misaki Fujishiro¹, Yoshihiro Kawahara¹, Hiroyuki Morikawa¹  
¹University of Tokyo, Japan

WPP21  Research on Dynamic Wireless Charging of Electric Vehicle Based on Double LCC Compensation Mode  
Xian Zhang¹, Jie Wang¹, Ming Xue¹, Yang Li¹, Qingxin Yang¹  
¹Tianjin Polytechnic University, China

WPP22  Research on Shield Structure of Inductively Coupled Power Transfer System  
Houji Li¹, Heqi Xu¹, Chunfang Wang¹  
¹Qingdao University, China
WPP23 Maximum Efficiency Point Tracking in Inductive Links: Series versus Parallel Receiver’s Compensation
Pablo Pérez-Nicolí, Fernando Silveira
1Universidad de la República, Uruguay

WPP24 Omni-directional Inductive Wireless Power Transfer with 3D MID inductors
Kamotesov Serguei, Philippe Lombard, Vincent Semet, Bruno Allard, Maël Moguedet, Michel Cabrera
1Smart Plastic Products (S2P), France, 2Université de Lyon, France

WPP25 Maximising Inductive Power Transmission using a Novel Analytical Coil Design Approach
Maryam Heidarian, Samuel J. Burgess, Radhakrishna Prabhu, Nazila Fough
1Robert Gordon University, United Kingdom

WPP26 Novel Calculation Model for Bunched Litz Wires
Christian Roth, Dieter Gerling
1Universität der Bundeswehr München, Germany

WPP27 Efficiency Improvement for Three-coil Cooperative Inductive Power Transfer Systems
Quoc-Trinh Vo, Quang-Thang Duong, Minoru Okada
1Nara Institute of Science and Technology, Japan

WPP28 Multiple-Receiver Wireless Power Transfer System Using a Cubic Transmitter
Hoang Le-Huu, Nam Ha-Van, Chulhun Seo
1Soongsil University, South Korea

WPP29 Capacitively Coupled Resonators for Misalignment-Tolerant Wireless Charging through Metallic Cases
Fabiano Cezar Domingos, Susanna Vital de Campos Freitas, Rashid Mirzavand, Pedram Mousavi
1University of Alberta, Canada

WPP30 Omnidirectional Power Transfer Through the Inductive and Capacitive Coupling Region of a Transmitter
Yen Po Wang, Reo Kometani, Shin’ichi Warisawa
1University of Tokyo, Japan

WPP31 Parallel Resonant Inductive Wireless Power Transfer
Hans W. Pflug, Steven Beumer, Koen Weijand, Tina Bartulović Ćulibrk, Jeroen Tol, Hubregt J. Visser
1GTX Medical BV, The Netherlands, 2Eindhoven University of Technology, The Netherlands, 3imec / Holst Centre, The Netherlands

WPP32 A Novel Dual Band Defected Ground Structure for Short Range Wireless Power Transfer Applications
Shalin Verma, Dinesh Rano, Mohammad Hashmi
1IIIT Delhi, India, 2Nazarbajev University, Kazakhstan

WPP33 Wireless Power Transfer through Low-e Glass
Shengming Shan, Vincent Hsiao, Ruey-Bing Hwang
1SWR Technology Inc., United States of America, 2National Chiao Tung University, Taiwan
WPP34  Designation of Wireless Power Transmitting System with Magnetic Megahertz Metamaterials
Guo Li\textsuperscript{1}, Lifang Lang\textsuperscript{1}, Jie Ren\textsuperscript{1}, Kai Fang\textsuperscript{1}, Yong Sun\textsuperscript{1}, Yewen Zhang\textsuperscript{1}, Yunhui Li\textsuperscript{1}, Hong Chen\textsuperscript{1}
\textsuperscript{1}Tongji University, China

WPP35  An Efficient Metamaterial Based Design of Wireless Power Transfer System
Pratim Dasmahapatra\textsuperscript{1}, Tarakeswar Shaw\textsuperscript{1}, Soumyadeep Kal\textsuperscript{1}, Debasis Mitra\textsuperscript{1}
\textsuperscript{1}Indian Institute of Engineering Science and Technology, India

WPP36  Qi Compliant Wireless Charger with PCB Integrated Magnetic Material
Gerald Weis\textsuperscript{1}, Ivan Salkovic\textsuperscript{1}, Gerald Weidinger\textsuperscript{1}, Mario Schober\textsuperscript{1}, Johannes Stahr\textsuperscript{1}, Ronald Sekavcnik\textsuperscript{1}
\textsuperscript{1}AT & S Austria Technologie & Systemtechnik Aktiengesellschaft, Austria

WPP37  Multiple FSK Data and Power Transmission System using Magnetic Resonance Wireless Power Transfer
Masaki Ishii\textsuperscript{1}, Kosuke Yamanaka\textsuperscript{1}, Masahiro Sasaki\textsuperscript{1}
\textsuperscript{1}Shibaura Institute of Technology, Japan

WPP38  A Novel Simultaneous Wireless Information and Power Transfer System
Xin Liu\textsuperscript{1}, Xijun Yang\textsuperscript{1}, Dianguang Ma\textsuperscript{1}, Nan Jin\textsuperscript{2}, Xiaoyang Lai\textsuperscript{1}, Houjun Tang\textsuperscript{1}
\textsuperscript{1}Shanghai Jia Tong University, China, \textsuperscript{2}Zhengzhou University of Light Industry, China

WPP39  125 kHz Wireless Energy and 25 kbps Data Transfer for Wearable Device
Diyang Gao\textsuperscript{1}, Rongpeng Zhai\textsuperscript{1}, Peter Baltus\textsuperscript{1}, Huib Visser\textsuperscript{1}, Hao Gao\textsuperscript{1}
\textsuperscript{1}Eindhoven University of Technology, The Netherlands

WPP40  Data Communication over a Novel Capacitive Resonant Wireless Power Transmission System
Semion Belau\textsuperscript{1}, Susanna Vital de Campos de Freitas\textsuperscript{1}, Fabiano Cezar Domingos\textsuperscript{1}, Rashid Mirzavand\textsuperscript{1}, Pedram Mousavi\textsuperscript{1}
\textsuperscript{1}University of Alberta, Canada

WPP41  Impact of 5G Waveforms on Energy Harvesting Rectifier Performance
Oludotun Olukoya\textsuperscript{1}, Boris Malcic\textsuperscript{2}, Djuradj Budimir\textsuperscript{1}, Djuradj Budimir\textsuperscript{3}
\textsuperscript{1}Westminster University, United Kingdom, \textsuperscript{2}University of Banja Luka, Bosnia and Herzegovina, \textsuperscript{3}University of Belgrade, Serbia

WPP42  Mixed-Time Scale Based Adaptive Mode Switching for Dual Mode SWIPT
Jong Jin Park\textsuperscript{1}, Jong Ho Moon\textsuperscript{1}, Kang-Yoon Lee\textsuperscript{1}, Dong In Kim\textsuperscript{1}
\textsuperscript{1}Sungkyunkwan University, Korea
PROGRAM: WIRELESS POWER WEEK 2019

15:15 – 17:00 Poster Session I – WoW
Chair: Christopher Kwan

WoW-P1 - Optimisation/Economics
Maxwell Library

WoP1 Parameter Optimization of Modern Tram Wireless Power Transfer Power Supply System
Geng Yuyu¹, Wang Yi¹, Yang Zhongping¹, Lin Fei¹
¹Beijing Jiaotong University, China

WoP2 Inductive Power Transfer Charging Infrastructure for Electric Vehicles: A New Zealand Case Study
Mingyue (Selena) Sheng¹, Ajith Viswanath Sreenivasan¹, Grant A. Covic¹, Douglas Wilson¹, Basil Sharp¹
¹University of Auckland, New Zealand

WoP3 Data-Driven Design and Assessment of Dynamic Wireless Charging Systems
Diala Haddad¹, Theodora Konstantinou¹, Akhil Prasad¹, Zhanxiang Hua¹, Dionysis Aliprantis¹, Konstantina Gkritza¹, Steven Pekarek¹
¹Purdue University, United States of America

WoW-P2 - Magnetic Design
Maxwell Library

WoP4 Investigation of the Influence of Split Ferrite Tiles in an Inductive Charging System with FEM-Simulation
Timo Lämmle¹, Nejla Parspour², Christian Fuchs²
¹MAHLE International GmbH, Germany, ²University of Stuttgart, Germany

WoP5 Statistical Model of Foreign Object Detection for Wireless EV Charger
Kaiwen Gan¹, Huan Zhang¹, Chen Yao¹, Xiaoyang Lai¹, Nan Jin², Houjun Tang¹
¹Shanghai Jiao Tong University, China, ²Zhengzhou University of Light Industry, China

WoW-P3 – System Characterisation
Maxwell Library

WoP6 Analysis of Bifurcation in Series-Series and Series-Parallel Compensated Inductive Power Transfer
Michal Košík¹, Jiří Lettl²
¹Czech Technical University in Prague, Czech Republic

WoP7 Quadrature Demodulator based Output Voltage and Load Estimation of a Resonant Inductive WPT Link
O. Trachtenberg¹, A. Shoihat¹, E. Beer¹, E. Fux¹, N. Tiktin², S. Kolesnik², A. Kuperman²
¹Nuclear Research Center of the Negev, Israel, ²Ben-Gurion University of the Negev, Israel

WoP8 Maximum Efficiency Control of a Wireless EV Charger with On-Line Parameter Calculation
Ali Zakerian¹, Sadegh Vaez-Zadeh¹, Amir Babaki¹
¹University of Tehran, Iran
WoP9  **Power Transfer Profile Boosting in DWC Systems by Two-Element Compensation Network**  
*Manuele Bertoluzzo*, *Rupesh Jha*, *Giuseppe Buja*  
1University of Padova, Italy, 2Zeal College of Engineering and Research, India

WoP10 **Analysis of Electromagnetic Force on Metal Objects in Vertical Direction of Wireless Power Transfer**  
*Xian Zhang*, *Xuejing Ni*, *Qingxin Yang*, *Bin Wei*, *Songcen Wang*  
1Tianjin Polytechnic University, China, 2China Electric Power Research Institute, China

WoP11 **Wireless Power At-A-Distance Technology – A Strategy for Nurturing Ecosystem Development**  
*Philip Swan*  
1Ossia Inc, United States of America

WoW-P4 – **Industrial Design and Applications**  
Siemens Boardroom

WoP12 **MPPT Control for PV based Wireless Power Transfer System in Lunar Rover by Secondary Side Converter**  
*Bingcheng Ji*, *Katsuhiro Hata*, *Takehiro Imura*, *Yoichi Hori*, *Shuhei Shimada*, *Osamu Kawasaki*  
1University of Tokyo, Japan, 2Japan Aerospace Exploration Agency, Japan

WoP13 **Strategy for Design of Misalignment Tolerant Inductive Powering System for Medical Implants**  
*Arseny Danilov*, *Eduard Mindubaev*, *Rafael Aubakirov*, *Konstantin Gurov*, *Oleg Surkov*, *Sergey Selishchev*  
1JSC ZITC, Russia

WoP14 **A Wide-Range IPT System for Body Worn Sensors**  
*Stephen G. Burrow*, *Lindsay R. Clare*  
1University of Bristol, United Kingdom

WoP15 **Approaching the Power Limit of an Electrodynamic WPTS with Nearly Coupling-Independent Operation**  
*Binh Duc Truong*, *Shad Roundy*  
1University of Utah, United States of America

WoP16 **Wireless Motor Drives with a Single Inverter in Primary Side of Power Transfer Systems**  
*Amir Babaki*, *Sadegh Vaez-Zadeh*, *Mohammad Jahanpour-Dehkordi*, *Ali Zakerian*  
1University of Tehran, Iran

WoP17 **Design of a 30 kW-85 kHz Wireless Power Transfer System for Charging Electric Vehicles**  
*Leyla Arioua*, *Hadi Alawieh*, *Salim Guerroudj*  
1VEDECOM institute, France
Wednesday 19 June

Registration

08:00 Registration & Coffee

WPTC Session 3 – Wearable and Biomedical Systems
Kelvin Lecture Theatre
Chairs: Alessandra Costanzo, Alexandru Takacs

08:25 An Octave Bandwidth RF Harvesting Tee-Shirt
José Antonio Estrada\textsuperscript{1}, Eric Kwiatkowski\textsuperscript{1}, Ana López-Yela\textsuperscript{2}, Mónica Borgoñós-García\textsuperscript{2}, Daniel Segovia-Vargas\textsuperscript{2}, Taylor Barton, and Zoya Popović\textsuperscript{1}
\textsuperscript{1}University of Colorado, United States of America, \textsuperscript{2}Universidad Carlos III de Madrid, Spain

08:40 A Wearable Passive Microwave Fluid Sensor Wirelessly Activated
Francesca Benassi\textsuperscript{1}, Nicola Zincarelli\textsuperscript{1}, Diego Masotti\textsuperscript{1}, Alessandra Costanzo\textsuperscript{1}
\textsuperscript{1}University of Bologna, Italy

08:55 Wireless Power Receiver with Wide Dynamic Range for Biomedical Implants
Hankyu Lee\textsuperscript{1}, Seungchul Jung\textsuperscript{1}, Yeunhee Huh\textsuperscript{1}, Sang Joon Kim\textsuperscript{1}
\textsuperscript{1}Samsung Advanced Institute of Technology, South Korea

09:10 Millimeter-Wave Textile Antenna for On-Body RF Energy Harvesting in Future 5G Networks
Mahmoud Wagih\textsuperscript{1}, Alex S. Weddell\textsuperscript{1}, Steve Beeby\textsuperscript{1}
\textsuperscript{1}University of Southampton, United Kingdom

09:25 Energy Harvesting of a NFC Flexible Patch for Medical Applications
Madjda Bouklachi\textsuperscript{1}, Marc Biancheri-Astier\textsuperscript{1}, Antoine Diet\textsuperscript{1}, Yann Le Bihan\textsuperscript{1}
\textsuperscript{1}Sorbonne Université, France

09:40 Feasibility Study of a Wireless Power Transfer System Applied to a Left Ventricular Assist Device
T. Campi\textsuperscript{1}, S. Cruciani\textsuperscript{1}, F. Orlando\textsuperscript{2}, F. Maradei\textsuperscript{2}, M. Feliziani\textsuperscript{1}
\textsuperscript{1}University of L’Aquila, Italy

WoW Session 3 – Multicoil Design
Turing Lecture Theatre
Chairs: David Yates, Jackman Lin

08:25 Investigation of a DD2Q Pad Structure for High Power Inductive Power Transfer
Benny J. Varghese\textsuperscript{1}, Abhilash Kamineni\textsuperscript{1}, Regan A. Zane\textsuperscript{1}
\textsuperscript{1}Utah State University, United States of America

08:40 Analysis of Intermediate Resonant Couplers for High Displacement Inductive Power Transfer
Ahmad Bilal\textsuperscript{1}, Grant Covic\textsuperscript{1}, John Boys\textsuperscript{1}, Seho Kim\textsuperscript{1}
\textsuperscript{1}University of Auckland, New Zealand
Magnetic Design of a Q-Coil for a 10 kW DDQ System for Inductive Power Transfer
Denis Kraus¹, Hans-Georg Herzog¹
¹Technical University of Munich, Germany

Reduced Switch Operation of the Tripolar for Interoperability in Inductive Power Transfer
Kaiquan Sun¹, Grant A. Covic¹, Duleepa Thrimawithana¹, Seho Kim¹
¹University of Auckland, New Zealand

A Three-Phase Inductive Power Transfer Coil with SAE J2954 WPT3 Magnetic Interoperability
Thorsten Kurpat¹, Lutz Eckstein¹
¹RWTH Aachen University, Germany

Power Transferability Analysis of I-SS-Buck Dynamic Wireless Charging System
Shuangcheng Song¹, Zhihao He¹, Chao Cui¹, Qianfan Zhang¹
¹Harbin Institute of Technology, China

Transit

Plenary Talk 3
Kelvin Lecture Theatre
Chairs: Grant Covic, Alessandra Costanzo

Advances in Wireless Power Transfer Technology & Implanted Medical Devices
Mirko de Melis
Medtronic, United States of America

Coffee Break

WPTC Session 4 – Microwave Power Converters
Kelvin Lecture Theatre
Chairs: Djuradj Budimir, Kenjiro Nishikawa

Time Trajectory Rectifier Impedance Analysis
Hans W. Pflug¹, Hubregt J. Visser²
¹GTX Medical BV, The Netherlands, ²imec / Holst Centre, The Netherlands

Investigation of a GaN-Based Bidirectional Wireless Power Converter Using Resonant Inductive Coupling
Haimeng Wu¹, Xiang Wang¹, Bowen Gu¹, Volker Pickert¹
¹Newcastle University, United Kingdom

Comparisons of MOSFET and Relay Switches in Impedance Matching Networks for Wireless Power Transfer
Cristina A. Alexandru¹, Dibin Zhu¹
¹University of Exeter, United Kingdom

A Comparison of Tunnel Diode and Schottky Diode in Rectifier at 2.4 GHz for Low Input Power Region
Veselin Manev¹, Huib Visser¹, Peter Baltus¹, Hao Gao¹
¹Eindhoven University of Technology, The Netherlands
12:15  **High Sensitive 2.4 GHz Band Rectenna with Direct Matching Topology**
Shunya Tsuchimoto¹, Kenji Itoh¹, Keisuke Noguchi¹, Jiro Ida¹
¹Kanazawa Institute of Technology, Japan

WoW Session 4 – Auxiliary Systems and Emissions
Turing Lecture Theatre
*Chairs: Ahn Seungyoung, Jae Lee*

11:15  **Effect of Fields Generated Through Wireless Power Transfer on Implantable Biomedical Devices**
Nunzio Pucci¹, Paul D. Mitcheson¹, Christopher H. Kwan¹, David C. Yates¹
¹Imperial College London, United Kingdom

11:30  **Conducted Emission in an 85 kHz, 50 kW WPT System with Opposite-Phase Transfer and Spread Spectrum**
Masatoshi Suzuki¹, Kenichirou Ogawa¹, Tetsu Shijo¹, Yasuhiro Kanekiyo¹, Kazuhiro Inoue¹, Koji Ogura¹, Shuichi Obayashi¹, Masaaki Ishida¹
¹Toshiba Corporation, Japan

11:45  **Omnidirectional Vehicle Sensing for Wireless Power Transfer Applications**
Charles A. Robinson¹, Hao Lu¹, C. W. Van Neste¹
¹Tennessee Technological University, United States of America

12:00  **Wireless Charging in Electric Vehicles: EMI/EMC Risk Mitigation in Pacemakers by Active Coils**
S. Cruciani¹, T. Campi¹, F. Maradei², M. Feliziani¹
¹University of L’Aquila, Italy, ²Sapienza University of Rome, Italy

Shihui Xu¹, Huan Zhang¹, Chen Yao¹, Dianguang Ma¹, Nan Jin², Houjun Tang¹
¹Shanghai Jiao Tong University, China, ²Zhengzhou University of Light Industry, China

Lunch

12:30  Lunch

WPTC Session 5 – Unconventional WPT Links
Kelvin Lecture Theatre
*Chairs: Naoki Shinohara, Ke Wu*

13:45  **Invited Talk**
Millimeter Wave Wireless Power Transmission-Technologies and Applications
Hooman Kazemi
Raytheon, United States of America

14:10  **Harvesting for Scattering Modulated RF-Signals Receivable by Mobile Telephones**
Matthias Schütz¹
¹IDP Invent AG, Switzerland
14:25  **Study on Antennas for Wireless Power Transfer to In-Line Inspection Robots**  
*Isami Sato*, *Naoki Shinohara*  
1*Kyoto University, Japan*

14:40  **A New Circularly Polarized Antenna Suppressing Surface Wave for Microwave Power Transmission**  
*Seishiro Kojima*, *Naoki Shinohara*  
1*Kyoto University, Japan*

14:55  **An RF-Powered IoT Node for Environment Sensoring**  
*John Nicot*, *Ludivine Fadel*, *Thierry Taris*  
1*University of Bordeaux, France*

15:10  **Compact Dual-Band Rectenna on a New Paper Substrate Based on Air-Filled Technology**  
*E. Vandelle*, *G. Ardila*, *S. Hemour*, *K. Wu*, *T.P. Vuong*  
1*Université Grenoble Alpes, France, 2Université de Bordeaux, France, 3Polytechnique Montréal, Canada*

**Woww Session 5 – Industrial Design and Applications**  
Turing Lecture Theatre  
*Chairs: Richard McMahon, Abhilash Kamineni*

13:45  **Invited Talk**  
*Solution for simplified wireless Inductive Power Transfer*  
*Jürgen Meins*  
*University of Braunschweig, Germany*

14:10  **Thermal Characterisation of a Double-D Pad**  
*Seho Kim*, *Maedeh Amirpour*, *Grant Covic*, *Simon Bickerton*  
1*University of Auckland, New Zealand*

14:25  **Design and Construction of a 100 W Wireless Charger for an E-Scooter at 6.78 MHz**  
*Christopher H. Kwan*, *Juan M. Arteaga*, *David C. Yates*, *Paul D. Mitcheson*  
1*Imperial College London, United Kingdom*

14:40  **Contactless Energy Transfer for Inductive Electrically Excited Synchronous Machines**  
*David Maier*, *Nejila Paspour*, *Jonas Kurz*  
1*University of Stuttgart, Germany*

14:55  **Performance of Inductive Power Transfer-based Pavements of Electrified Roads**  
*Ahmed Marghani*, *Douglas Wilson*, *Tam Larkin*  
1*University of Auckland, New Zealand*

15:10  **Inductive Power Delivery with Acoustic Distribution to Wireless Sensors**  
*David E. Boyle*, *Steven W. Wright*, *Michail E. Kiziroglou*, *Akshaya Pandiyan*, *Eric M. Yeatman*  
1*Imperial College London, United Kingdom*

**Coffee Break**

15:25  **Coffee Break**

15:50 – 17:00  **Panel Session – The future of WBG devices in power processing and wireless power**  
*Kelvin Lecture Theatre*  
*Chaired by: Compound Semiconductor Applications Catapult*
Thursday 20 June

Registration

08:00  Registration & Coffee

WPTC Session 6 – Antenna and Systems for WPT
Kelvin Lecture Theatre
Chairs: Bart Smolders, Pedram Mousavi

08:25  Energy Focusing Through Layout-Based Frequency-Diverse Arrays
Diego Masotti¹, Mazen Shanawani¹, Alessandra Costanza¹
¹University of Bologna, Italy

08:40  Implementation of a High-Efficient and Simple CPW Rectenna at the 2.45 GHz ISM Radio Band
Mohamed Mansour¹, Haruichi Kanaya¹
¹Kyushu University, Japan

08:55  An Efficient RF Power Transfer Scheme using Location-based Phase-controlled Array Antenna
Eui Bum Lee¹, Wonshil Kang¹, Hyunchul Ku¹
¹Konkuk University, South Korea

09:10  Study on Multipath Retrodirective for Efficient and Safe Indoor Microwave Power Transmission
Taichi Sasaki¹, Naoki Shinohara¹
¹Kyoto University, Japan

09:25  Efficiency of Wireless Power transfer with a Multi-sine Source Optimized for the Propagation Channel
Regis Rousseau¹, Guillaume Villemaud¹, Florin Hutu¹
¹University of Lyon, France

09:40  Beaming Efficiency of 1-D Frequency-Scanned Based Radiative WPT System for Wireless Sensor Networks
Miguel Poveda-García¹, José Luis Gómez-Tornero¹
¹Technical University of Cartagena, Spain, ²University of Aveiro, Portugal

WoW Session 6 – Dynamic IPT
Turing Lecture Theatre
Chairs: Regan Zane, Seho Kim

08:25  Charging Infrastructure Design for In-motion WPT Based on Sensorless Vehicle Detection System
Katsuhiro Hata¹, Takehiro Imura¹, Hiroshi Fujimoto¹, Yoichi Hori¹, Daisuke Gunji²
¹University of Tokyo, Japan, 2NSK Ltd., Japan

08:40  Push-pull driven Low-cost Coupler Array for Dynamic IPT systems
Vahid Zahiri Barsari¹, Duleepa J Thrimawithana¹, Grant A. Covic¹
¹University of Auckland, New Zealand
Sensorless Automatic Stop Control of Electric Vehicle in Semi-dynamic Wireless Charging System
Jirawat Sithinamsuwan¹, Kensuke Hanajiri¹, Katsuhiro Hata¹, Takehiro Imura¹, Hiroshi Fujimoto¹, Yoichi Hori¹
¹University of Tokyo, Japan

Comparison of Single and Three phase Dynamic Charging Systems for Electric Vehicles
Van-Binh Vu¹, Mohamed Dahidah¹, Volker Pickert¹, Van-Tung Phan¹
¹Newcastle University, United Kingdom

One-Sided Magnetic Field Halbach Pad for EV Wireless Charging
Mei Su¹,², Tao Ling¹,², Qi Zhu¹,², and Pengcheng Wang¹,²
¹Central South University, China, ²Human Provincial Key Laboratory of Power Electronics Equipment and Grid, China

A Concept of Multiphase Dynamic Charging System with Constant Output Power for Electric Vehicles
Van-Binh Vu¹, Mohamed Dahidah¹, Volker Pickert¹, Van-Tung Phan¹
¹Newcastle University, United Kingdom

Coffee Break

High Efficient Wireless Power Transfer System for AUV with Multiple Coils and Ferrite under Sea
Ryosuke Hasaba¹, Katsuya Okamoto¹, Tatsuo Yagi¹, Souichi Kawata¹, Kazuhiro Eguchi¹, Yoshio Koyanagi¹
¹Panasonic Corporation, Japan

Capacitive Resonant System to Charge Devices with Metallic Embodiments
Susanna Vital de Campos de Freitas¹, Fabiano Cezar Domingos¹, Rashid Mirzavand¹, Pedram Mousavi¹
¹University of Alberta, Canada

Optimizing the Power Output for a Capacitive Wireless Power Transfer System with N receivers
Ben Minnaert¹, Franco Mastri², Alessandra Costanzo², Mauro Mongiardo³ and Nobby Stevens⁴
¹Odisee University College of Applied Sciences, Belgium, ²University of Bologna, Italy, ³University of Perugia, Italy, ⁴KU Leuven, Belgium

Multifactorial Rig for Study of Inductive Powering Systems with Arbitrary Orientation of the Coils
Arseny A. Danilov¹, Eduard A. Mindubaev¹, Konstantin O. Gurov¹
¹JSC ZITC, Russia
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11:25 Determination of the Optimal Resonant Condition for Multi-receiver Wireless Power Transfer Systems
Seung Beop Lee1, Mingi Kim2, In Gwun Jang2
1Chonbuk National University, South Korea, 2KAIST, South Korea

11:40 A Wireless Charging Coil in Printed Circuit Board with Partially Split Conductors for Low Resistance
Yujun Shin1, Jaehyoung Park1, Haerim Kim1, Bumjin Park1, Jongwook Kim1, Chanjun Park1, Seungyoung Ahn1
1KAIST, South Korea

WoW Session 7 – High Frequency WPT
Turing Lecture Theatre
Chairs: Burak Ozpineci, Juan Arteaga

10:25 Quarter Wavelength Surface Structures for Improved Operation in Unipolar Capacitive Power Transfer
Donald Chaney1, Charles A. Robinson1, C. W. Van Neste1
1Tennessee Technological University, United States of America

10:40 A Phase-controlled Stacked-transmitter Wireless Power Transfer System for Magnetic Field Beamforming
Ning Kang1, Ming Liu2, Chengbin Ma1
1Shanghai Jiao Tong University, China, 2Princeton University, United States of America

10:55 High Power Density Stacked-Coils Based Power Receiver for MHz Wireless Power Transfer
Jibin Song1, Ming Liu2, Minfan Fu3, Chengbin Ma1
1Shanghai Jiao Tong University, China, 2Princeton University, United States of America, 3ShanghaiTech University, China

11:10 Design of a Switchable Driving Coil for Magnetic Resonance Wireless Power Transfer
Yelzhas Zhaksylyk1, Ulrik Hanke1, Mehdi Azadmehr1
1University of South-Eastern Norway, Norway

11:25 E-Field Analysis of a 3D Capacitive Power Transfer Configuration with Single Source Excitation
Qi Zhu1,2, Lixiang Jackie Zou3, Mei Su1,2, Aiguo Patrick Hu3
1Central South University, China, 2Human Provincial Key laboratory of power Electronics Equipment and Grid, China, 3University of Auckland, New Zealand

11:40 Compactly Assembled Transmitting and Receiving Modules with Shield for Capacitive Coupling Power Transfer System
Aam Muharam1,2, Mitsuru Masuda1, Reiji Hattori1, Abdul Hapid3
1Kyushu University, Japan, 2Furukawa Electric Co., Japan, 3Indonesian Institute of Sciences, Indonesia

Lunch

11:55 Lunch
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WPTC Session 8 – Novel Transmitter Architectures
Kelvin Lecture Theatre
Chairs: Bart Smolders, Simon Hemour

13:20 Invited Talk
WPT: from \( \mu \text{W/cm}^2 \) harvesting to kW capacitive powering
Zoya Popovic
University of Colorado, United States of America

13:45 2.45-GHz Wireless Power Transmitter with Dual-Polarization-Switching Cantenna for LED Accessories
Kosuke Yoshida\(^1\), Norifumi Kashiyama\(^1\), Miho Kanemoto\(^1\), Shogo Umemoto\(^1\), Hisashi Nishikawa\(^1\), Ami Tanaka\(^1\), Takakuni Douseki\(^1\)
\(^1\)Ritsumeikan University, Japan

14:00 Thermal Performance of Class-FF Converter Used for Wireless Power Transfer in Retinal Implants
Iman Abdali Mashhadi\(^1\), Behzad Poorali\(^1\), Majid Pahlevani\(^1\)
\(^1\)University of Calgary, Canada

14:15 Development of an Automatic Bidirectional Wireless Charging System for Mobile Devices
James Washak\(^1\), Cristina Alexandru\(^1\), Dibin Zhu\(^1\)
\(^1\)University of Exeter, United Kingdom

14:30 Implementation of Constant Current Performance of 13.56MHz Wireless Power Transfer System
Heng-Ming Hsu\(^1\), Yan-Kai Huang\(^1\), Tung-Lin Wu\(^1\)
\(^1\)National Chung Hsing University, Taiwan

14:45 A Distributed, Phase-locked, Class-E, RF Generator with Automatic Zero-Voltage Switching
Robert A. Moffatt\(^1\), Trevor Howarth\(^1\), Connor Gafner\(^1\), Jeffrey J. Yen\(^1\), Feng-Kai Chen\(^1\), Josh Yu\(^1\)
\(^1\)Etherdyne Technologies Inc., United States of America

WoW Session 8 – Converter Design & Control
Turing Lecture Theatre
Chairs: Volker Pickert, Duleepa Thrimawithana

13:20 Invited Talk
Progress Towards Extreme Fast Wireless Static and Dynamic Charging
Burak Ozpineci
Oak Ridge National Laboratory, United States of America

13:45 500W 13.56MHz Class EF Push-pull Inverter for Advanced Dynamic Wireless Power Applications
Samer Aldhaher\(^1\), Paul D. Mitcheson\(^1\)
\(^1\)Imperial College London, United Kingdom

14:00 Design Method for Resonant Inductive Power Transfer Systems Using a Resistor Ladder Prototype
Aaron D. Scher\(^1\), Bogdan Z. Savic\(^1\), Kalena L. Ching\(^1\), Irvin H. Nguyen\(^1\), William Garibo\(^1\), Mohamud Hussein\(^1\)
\(^1\)Oregon Institute of Technology, United States of America
14:15  Misalignment Tolerant Control of an Inductive Charger for Electric Vehicles with V2G Possibilities  
Wiljan Vermeer¹, Soumya Bandyopadhyay¹, Pavol Bauer¹  
¹Delft University of Technology, The Netherlands  

14:30  Design of the Primary Side LCC Compensation Network Based on ZVS for Wireless Power Transfer Systems  
Yuwang Zhang¹,², Yanjie Guo¹,³, Lifang Wang¹,³  
¹Key Laboratory of Power Electronics and Electric Drives Institute of Electrical Engineering Chinese Academy of Sciences, China, ²University of Chinese Academy of Sciences, China, ³Beijing Co-Innovation Center for Electric Vehicles  

14:45  A Wireless Power Transfer System with a Primary-Side Process Variable for Maximum Efficiency Control  
Aaron D. Scher¹  
¹Oregon Institute of Technology, United States of America  

Poster Session II and Coffee Break  
15:00 – 17:00  Poster Session II – WPTC  
Chair: Ben Minnaert  

WPTC P4 – WPT Architectures  
Maxwell Library  

WPP43  Improving Conversion Loss Performance of Fully Passive Harmonic Transponder at Low Temperature  
Xiaoqiang Gu¹, Simon Hemour², Ke Wu¹  
¹Polytechnique Montreal, Canada, ²University of Bordeaux, France  

WPP44  DIY Electromagnetic Phantoms for Biomedical Wireless Power Transfer Experiments  
Tom van Nunen¹, Esmee Huismans¹, Rob Mestrom¹, Mark Bentum¹, Hubregt Visser¹  
¹Eindhoven University of Technology, The Netherlands  

WPP45  Voltage Multiplier Rectifier with Second Harmonic Resonance for Wireless Power Transfer System  
Juwan Kim¹, Wonsil Kang¹, Hyunchul Ku¹  
¹Konkuk University, South Korea  

WPP46  Demonstration of Sub-Terahertz Coplanar Rectenna using 265 GHz Gyrotron  
Sei Mizojiri¹, Kengo Takagi¹, Kohei Shimamura¹, Shigeru Yokota¹, Masafumi Fukunari², Yoshinori Tatematsu², Teruo Saito²  
¹University of Tsukuba, Japan, ²University of Fukui, Japan  

WPP47  The Logistics System by Rotary Wing Unmanned Aerial Vehicle with 28GHz Microwave Power Transmission  
Satoru Suganuma¹, Duc Hung Nguyen², Yuma Nishioka¹, Kohei Shimamura¹, Koichi Mori², Shigeru Yokota¹  
¹University of Tsukuba, Japan, ²Nagoya University, Japan
Design of Rectifiers for High Power Wireless Power Transmission System
Ce Wang1, Bo Yang1, Naoki Shinohara1
1Kyoto University, Japan

A Rectenna Using Copper Foil on Glass to Reduce Cost of Space Solar Power
Evan Shi1, Erik Centeno1, Rafael Figueroa1, Cheng Qi1, Gregory Durgin1
1Georgia Tech, United States of America

Photonic-Assisted Field-Probing Receiver for kW Peak-Power Wideband Radiative Wireless Transmitter
Young-Pyo Hong1, Jung-II Park1, No-Weon Kang1, Dong-Joon Lee1
1Korea Research Institute of Standards and Science, South Korea

An RF-Powered Self-Locating Flexible Building Environment Sensor System
David Schwartz1, Shabnam Ladan1, Vijay Karthik Venkatasubramanian1, Joseph Lee1, Ping Mei1, Brent Krusor1, Clinton Smith1, Shakthi Gowri1
1Palo Alto Research Center, United States of America

We’ve Got the Power: Overcoming the Distance Enlargement Fraud with Wireless Power Transfer
Leo Botler1, Konrad Diwold1, Kay Römer1
1Graz University of technology, Austria

An Improved Rectenna Design for Battery-free Wireless Sensors and Structural Health Monitoring
A. Sidibe1, A. Tacaks1, A. Okba1, G. Loubet1
1Université de Toulouse, France

Chipless Backscatter for Vital e-Health Sensing
Felisberto Pereira1, Ricardo Correia1, Nuno B. Carvalho1
1Universidade de Aveiro, Portugal

Pacemaker Recharge Through Inductive Resonant Wireless Power Transfer
Giuseppina Monti1, Laura Corchia1, Luciano Tarricone1
1University of Salento, Italy

Implantable Rectenna System for Biomedical Wireless Applications
Shuoliang Ding1, Stavros Koulouridis2, Lionel Pichon1
1Université Paris-Sud, France, 2University of Patras, Greece

A Study on Dynamic Charging Using Off-Resonant Coil Array With Receiver-side Compensation
Tatsuya Ohashi1, Quang-Thang Duong1, Minoru Okada1
1Nara Institute of Science and Technology, Japan

A Reconfigurable Antenna for Enhancing the Magnetic Coupling in WPT
Jaafar Al Sinayyid1, Hakim Takhedmit1, Patrick Poulchét1, Marjorie Grzeskowiak2, Antoine Diet3, Gaëlle Lissorgues1
1Université Paris-Est, France, 2Deos Isae Supaero, France, 3Université Paris-Sud, France

13.56 MHz Near Field Magnetic Coupling Efficiency Evaluation for IMDs Powering
Antoine Diet1, Marc Biancheri-Astier1, Yann Le Bihan1, Pablo Pérez-Nicolás1, Madjda Bouklachi1, Olivier Meyer1, Fernando Silveiro2, Lionel Pichon1
1Université Paris-Sud, France, 2Universidad de la República, Uruguay
WPP60 Research on Wireless Power Transfer in Modular Spacecraft
Longlong Zhang¹, Lei Wang¹, Haidi Yu¹, Yan Zong¹, Yucai Zhang¹, Xudong Ming¹, Zhenyu Zhang¹
¹Shandong Institute of Space Electronics Technology, China

WPP61 Charging Base Stations Deployment Algorithms for Wireless Rechargeable Sensor Networks
Peng Wan¹, Baoyu Wu¹, Yuhua Cheng¹, Gaofeng Wang¹
¹Hangzhou Dianzi University, China

WPP62 Coupled Magnetic Field-Circuit Analysis of Inductive Power Transfer in High-Potential Transformers
Alex Pokryvailo¹, Hiren Dave¹
¹Spellman High Voltage Electronics Corp., United States of America

WPP63 Charging Area Extensible Wireless power Transfer System with an Orthogonal Structure
Chen Xu¹, Yuan Zhuang¹, Anqi Chen¹, Yi Huang¹, Jiafeng Zhou¹
¹University of Liverpool, United Kingdom

WPP64 Innovative Technique for HPA Characteristics Extraction and Accurate Predistorsion Function Modeling
Blaise Mulliez¹, Emmanuel Moutaye¹, Hélène Tap¹
¹Université de Toulouse, France

WPP65 MSA with Stacked Metal Rings for Rectenna System using Narrow Beam
Seiya Mizuno¹, Ryosuke Kashimura¹, Tomohiro Seki¹, Yasunori Suzuki¹, Hiroshi Okazaki³
¹Nihon University, Japan, ²Japan Radio Co., Ltd., Japan, ³NTT Docomo Inc., Japan

WPP66 Free-Positioning Magnetic Resonance Wireless Power Transfer System for Biomedical Devices
Kyungmin Na¹, Jieun Kim¹, Young-Jin Park¹
¹Korea Electrotechnology Research Institute, South Korea

WPP67 Analysis of the Efficiency of Wireless Power Transfer to Multiple Receivers
Wanberton Gabriel de Souza¹, Luciano Coutinho Gomes¹, Darizon Alves de Andrade¹, Lucas Rocha Lobo Lannes¹, Josemar Alves dos Santos Jr.¹, Eustáquio Fernandes Júnior¹
¹University Federal of Uberlândia, Brasil

WPP68 Geometric Quantities Characterizing Wireless Power Transfer Between a Resonator and Resonant Dipoles
Robert A. Moffatt¹
¹Etherdyne Technologies, Inc., United States of America

WPP69 Rectenna for Bluetooth Low Energy Applications
Boules A. Mouris¹, Wael Elshennawy², Panagiotis Petridis¹, Yuan Ding³, Spyridon N. Daskalakis³
¹KHT Royal Institute of Technology, Sweden, ²Orange Business Services, Egypt, ³Heriot-Watt University, United Kingdom

WPP70 Temperature Induced Degradation of RF Energy Harvesters Efficiency: Experiments and Interpretation
Massimo Merenda¹, Riccardo Carotenuto¹, Francesco G. Della Corte¹
¹Mediterranea University Reggio Calabria, Italy
WPP71  **Analysis of Transmission Distance and Transmission Efficiency of Wireless Power Transfer System**
Rongge Yan¹, Zexun Wu¹, Xiaoting Guo¹, Shaoqing Cao¹
¹Hebei University of Technology

WPP72  **Traveling-Wave Fed Two-Dimensional Phased-Array Antenna for Microwave-Power Transfer**
Naoki Hasegawa¹, Yuki Takagi¹, Yoshichika Ohta¹
¹Softbank Corp., Japan

M. Aparna¹, Bitragunta Sainath¹
¹BITS Pilani, India

WPP74  **A Study of Improve Efficiency of Broad-Angle Rectenna Using Hybrid Coupler**
Yuki Tanaka¹, Kazuki Kanai¹, Ryoosuke Hasaba¹, Hiroshi Sato¹, Yoshihisa Koyanagi¹, Takuma Ikeda¹, Hiroku Tani¹, Shoichi Kajiiwa¹ and Naoki Shinohara²
¹Panasonic Corporation, Japan, ²Kyoto University, Japan

WPP75  **Influences of Magnetic Couplings in Transmitter Array of MIMO Wireless Power Transfer System**
KyuMor Kim¹, Ji-Woong Choi¹
¹Daegu Gyeongbuk Institute of Science and Technology, South Korea

WPP76  **Development of Wireless Power Supply Implantable Device Based on LED**
Li Yamin¹, Tang Jun¹, Liu Kun¹
¹Chinese Academy of Sciences, China

WPP77  **Visualization of Energy Flow in Wireless Power Transfer Systems**
Hanwei Wang¹, Cheng Zhang², Shu Yuan Ron Hui³
¹Tsinghua University, China, ²University of Manchester, United Kingdom, ³University of Hong Kong, China

WPP78  **Proposal of Simplified Transfer Function Model for Dynamic Rectified DC Voltage in DWPT**
Kodai Takeda¹, Wataru Ohnishi¹, Takefumi Koseki¹
¹University of Tokyo, Japan

WPP79  **Voltage Control and Current Distribution for Multiple-Coil Wireless Power Transfer System**
Weikun Cai¹, Houjun Tang¹, Dianguang Ma¹, Xin Liu¹
¹Shanghai Jiao Tong University, China

WPP80  **A Self-Synchronous Rectifier for Application of W-level Input Power**
Ying Wang¹, Gao Wei¹, Fei You², Xumin Yu³, Yazhou Dong³, Xiaojun Li³
¹Northwestern Polytechnical University, China, ²University of Electronic Science and Technology of China, China, ³China Academy of Space Technology, China

WPP81  **Experimental Evaluation of Coupling Coils for Underwater Wireless Power Transfer**
Cândido Duarte¹, Francisco Gonçalves¹, Miguel Silva¹, Vasco Correia¹, Luis M. Pessoa¹
¹INESC TEC and FEUP, Portugal
Hybrid Mode Wireless Power Transfer for Wireless Sensor Network
Shi-Wei Dong¹, Xiaojun Li¹, Xumin Yu¹, Yazhou Dong¹, Hao Cui¹, Tao Cui¹, Ying Wang¹, Shuo Liu¹
¹China Academy of Space, China

EMI Suppression of MEMS Honeycomb-Shaped Inductor on Oscillators for Wireless-Powered IC Design
Hao-Jiun Wu¹, Po-Ming Wang¹, Tzuen-Hsi Huang¹, Sheng-Fan Yang²
¹National Cheng Kung University, Taiwan, ²Global Unichip Corp., Taiwan

A Comparative Study of Conventional Rectifier Topologies for Low Power RF Energy Harvesting
Jérôme Tissier¹, Mohsen Koohestani¹, Mohamed Latrach¹
¹ESEO-IETR, France

Modified Log Periodic Spiral Antenna for Multi-Band RF Energy Harvesting Applications
Kapil Gangwar¹, Jérôme Tissier²
¹Indian Institute of Technology, India, ²ESEO-IETR, France

Theoretical Analysis of Single Shunt Rectifiers
Takashi Hirakawa¹, Naoki Shinohara¹
¹Kyoto University, Japan

Design of Buck Converter with Dead-time Control and Automatic Power-Down System for WSN Application
Jefferson A. Hora¹, Aileen Chris Arellano², Eryk Dutkiewicz¹, Xi Zhu¹
¹University of Technology Sydney, Australia, ²MSU-Iligan Institute of Technology, Philippines

A 19.6 dB Input Power Range 403 MHz Rectifier Based on Quality Factor in Matching Technique
NgocDuc Au¹, Chulhun Seo¹
¹Soongsil University, South Korea

Voltage-Double RF Rectifier using Inductive Matching Network
Muh-Dey Wei¹, Renato Negra¹
¹RWTH Aachen University, Germany

10W Class High Power C-Band Rectifier Using GaN HEMT
Satoshi Yoshida¹, Kenjiro Nishikawa¹, Shigeki Kawasaki²
¹Kagoshima University, Japan, ²Japan Aerospace Exploration Agency (JAXA), Japan

Automated Design Optimization for CMOS Rectifier Using Deep Neural Network (DNN)
Heng Wah Ho¹, Wendy W.Y. Lau²
¹GLOBALFOUNDRIES Singapore Pte. Ltd., Singapore, ²Nanyang Technological University, Singapore

2x2 Circularly Polarized Antenna Array with Equal Phases for RF Energy Harvesting in IoT System
Osama M. Dardeer¹, Halia A. Elsadek², Esmat A. Abdallah², Hadia M. Elhennawy¹
¹Ain Shams University, Egypt, ²Electronics Research Institute, Egypt
1 MHz band rectenna with several rectifier devices in nW operation
Nobuhiko Yasumaru\textsuperscript{1}, Kanto Nakanishi\textsuperscript{1}, Kenji Itoh\textsuperscript{1}, Shunya Tsuchimoto\textsuperscript{1}, Takuya Yamada\textsuperscript{1}, Takayuki Mori\textsuperscript{1}, Jiro Ida\textsuperscript{1}
\textsuperscript{1}Kanazawa Institute of Technology, Japan

15:05 – 17:00 Poster Session II – WoW
Chair: Sam Aldhaher

WoW-P5 – Dynamic IPT
Maxwell Libaray

WoP18 Coupling Coefficient Estimation for Wireless Power Transfer System at Constant Input Power Operation
Haruko Nawada\textsuperscript{1}, Yoshiaki Takahashi\textsuperscript{1}, Katsuhiro Hata\textsuperscript{1}, Takehiro Imura\textsuperscript{1}, Hiroshi Fujimoto\textsuperscript{1}, Yaichi Hori\textsuperscript{1}, Takuya Yabumoto\textsuperscript{2}
\textsuperscript{1}University of Tokyo, Japan, \textsuperscript{2}Mitsubishi Electric Corporation, Japan

WoP19 A Dynamic Wireless Charging System with a Robust Output Voltage Respect To Misalignment
Ali Ramezani\textsuperscript{1}, Mehdi Narimani\textsuperscript{1}
\textsuperscript{1}McMaster University, Canada

WoP20 A Dynamic Model for Contactless Energy Transfer Systems
Jannis Noeren\textsuperscript{1}, Nejila Parspour\textsuperscript{1}
\textsuperscript{1}University of Stuttgart, Germany

WoP21 Feasibility Study on In-motion Wireless Power Transfer System Before Traffic Lights Section
Dasiuke Gunji\textsuperscript{1}, Katsuhiro Hata\textsuperscript{2}, Osamu Shimizu\textsuperscript{2}, Takehiro Imura\textsuperscript{2}, Hiroshi Fujimoto\textsuperscript{2}
\textsuperscript{1}NSK Ltd., Japan, \textsuperscript{2}University of Tokyo, Japan

WoP22 Dual-phase IPT Track Primary Evaluation Using Normalized Coupling Factor
Weitong Chen\textsuperscript{1}, Feiyang Lin\textsuperscript{1}, Grant Covic\textsuperscript{1}, John Boys\textsuperscript{1}
\textsuperscript{1}Auckland University, New Zealand

WoP23 An Alternate Arrangement of Active and Repeater Coils for Quasi-Constant Power Wireless EV Charging
Chunsheng Wang\textsuperscript{1,2}, Pengcheng Wang\textsuperscript{1,2}, Qi Zhu\textsuperscript{1,2}, Mei Su\textsuperscript{1,2}
\textsuperscript{1}Central South University, China, \textsuperscript{2}Human Provincial Key Laboratory of Power Electronics Equipment and Grid, China

WoP24 A Modular and Distributed Grid Interface for Transformer-less Power Supply to Road-side Coil Sections of Dynamic Inductive Charging Systems
Giuseppe Guidi\textsuperscript{1}, Salvatore D’Arco\textsuperscript{1}, Jon Are Suul\textsuperscript{1,2}
\textsuperscript{1}SINTEF Energy Research, Norway, \textsuperscript{2}Norwegian University of Science and Technology, Norway
WoW-P6 – High Frequency WPT
Maxwell Library

WoP25 Load Adaptation of Capacitive Power Transfer System with a Four-Plate Compact Capacitive Coupler
Xueying Wu¹, Yugang Su¹, Xinyu Hou¹, Xiaodong Qing¹, Wanting Zhu¹
¹Chongqing University, China

WoP26 Impacts of Coupling Plates on Single-Switch Capacitive-Coupled WPT Systems
Yashwanth Bezawada¹, Ruiyun Fu², Yucheng Zhang¹
¹Old Dominion University, United States of America, ²Mercer University, United States of America

WoP27 A 13.56 MHz Inductive Power Transfer System Operating with Corroded Coils
Epameinondas Skountzos¹, Juan M. Arteaga¹, Eftychios Hadjittofis¹, David C. Yates¹
Kyra L. Sedransk-Campbell¹, Paul D. Mitcheson¹
¹Imperial College London, United Kingdom

WoP28 A High-Performance Double-Sided LC Compensated CPT System with Load-Independent Constant Current Output
Jing Lian¹, Xiaohui Qu¹
¹Southeast University, China

WoP29 A High Power WPT System for Through the Wall Applications
Tiefeng Shi¹, Paul Wiener¹
¹GaN Systems Inc., Canada

WoW-P7 – Converter Design & Control
Siemens Boardroom

WoP30 Triple Subdivision Cell-to-Cell Mapping Method for Global Analysis of WPT System
Chensen Tang¹, Chunyan Yang¹, Yingjun Fei¹, Zhihui Wang¹, Zhiping Zuo¹, Zhenpeng Zhang²
¹Chongqing University, China, ²China Electronic Power Research Institute, China

WoP31 Full Duplex Communication Based on Partial Power Coil in Inductive Coupling Power Transfer System
Cheng Li¹, Zhi-Hui Wang¹, Yue Sun¹, Xin Dai¹
¹Chongqing University, China

WoP32 High-Power WPT Systems: Step-up Transformer vs. Partial-Series Tuning
Wenwei Victor Wang¹, Duleepa J. Thrimawithana¹
¹University of Auckland, New Zealand

WoP33 Efficiency Maximization in Wireless Power Transfer Systems for Resonance Frequency Mismatch
Helanka Weerasekara¹, Katsuhiro Hata¹, Takehiro Imura¹, Hiroshi Fujimoto¹, Yoichi Hori¹
¹University of Tokyo, Japan

WoP34 Advantages and Tuning of Zero Voltage Switching in a Wireless Power Transfer System
Francesca Graziani¹, Peter van Duijzen¹, Thiago B. Soeiro¹, Pavol Bauer¹
¹Delft University of Technology, The Netherlands
PROGRAM: WIRELESS POWER WEEK 2019

WoP35  Surge Current Analysis of EV Wireless Charging System during Short-circuit Decoupling Process
Ke Shi¹, Chunsen Tang¹, Zhihui Wang¹, Zhiping Zuo¹
¹Chongqing University, China

WoP36  Multiple-Receiver Wireless Power Transfer with Efficient Power Control Strategy
Weikun Cai¹, Houjun Tang¹, Xiaoyang Lai¹, Longzhao Sun¹
¹Shanghai Jiao Tong University, China

WoP37  Inductive Power Transfer System with Automatic Control
Chenlei Liu¹, Xin Liu²
¹Shanghai Electric Power Research Institute, China, ²Shanghai Jiao Tong University, China

WoP38  Output Voltage Range of a Resonant Inductive WPT Link Operating in Load Independent Regime
Yotam Frechter¹, Yegal Darhovsky¹, Alon Kuperman¹
¹Ben-Gurion University of the Negev, Israel

WoP39  Dynamic Modeling and Analysis of Multi-Receiver Wireless Power Transfer System
Tian Tan¹, Kainan Chen¹, Ye Jiang¹, Zhengming Zhao¹, Liqiang Yuan¹
¹Tsinghua University, China

WoP40  Adaptive Capacitance Impedance Matching (ACIM) of WPT Systems by Voltage Controlled Capacitors
Stanislav Tishechkin¹, Shmuel (Sam) Ben-Yaakov¹
¹Ben-Gurion University, Israel

WoP41  A Wireless Power Transfer System Powering Multiple Gate Drivers in a Modular Multilevel Converter
Zhe Zhou¹, Weiguo Li¹,², Chenweng Cheng³, Chao Wang³, Zhanfeng Deng¹, Chris Mi³
¹Global Energy Interconnection Research Institute, China, ²State Grid Corporation of China, China, ³San Diego State University, United States of America

18:00 – 22:00  Banquet

“Tesla’s Secret London Laboratory”
Friday 21 June

Registration

08:00  Registration & Coffee

WPTC & WoW Joint Session 1 – High Power and Ultrasonic WPT
Kelvin Lecture Theatre
Chairs: Grant Covic, Mario Ferreira

08:25  Development of a 10 kW Wireless Power Transfer System
Alex Ridge1, Ku Ku Ahamed1, Richard McMahon1, John Miles2
1University of Warwick, United Kingdom, 2University of Cambridge, United Kingdom

08:40  Thin, Light & Flexible Magnetic Materials for 7.7 kW Wireless Power Transfer System
Zohaib Hameed1, Milo Oien-Rochat1, Charles Bruzzone1, Ian Cummings1, Jeff Keeney1, Michael Benson1
13M Company, United States of America

08:55  High Efficiency Wireless Power Transfer System using a Two-stack Hybrid Metamaterial Slab
Seongsoo Lee1, Yeonje Cho2, Seungtaek Jeong1, Seokwoo Hong1, Boogyo Sim1, Hongseok Kim3, Joungho Kim1
1Korea Advanced Institute of Science and Technology (KAIST), South Korea, 2Samsung, South Korea, 3Missouri University of Science and Technology (MST), United States of America

09:10  Resistive Matching using an AC Boost Converter for Efficient Ultrasonic Wireless Power Transfer
Marc Bisschop1, Wouter A. Serdijn1
1Delft University of Technology, The Netherlands

09:25  Mutual Inductance Modeling of In-wheel Arc-shaped Coil for In-motion WPT
Osamu Shimizu1, Takehiro Imura1, Hiroshi Fujimoto1, Daisuke Gunji2, Keizo Akutagawa3, Giuseppe Guidi4
1University of Tokyo, Japan, 2NSK Ltd., Japan, 3Bridgestone Corporation, Japan, 4Sintef Energy, Norway

09:40  Transit

Plenary Talk 4
Kelvin Lecture Theatre
Chairs: Udaya Madawala, Huib Visser

09:45  Large-area Wireless Charging Enabled by Metamaterials
Irina Khromova
Metaboards, United Kingdom

Coffee Break

10:30  Coffee Break
WPTC & WoW Joint Session 2 – Moving WPT Systems
Kelvin Lecture Theatre
Chairs: David Yates, Djuradj Budimir

11:00  **Joint Invited Talk 2**
Wireless power market set to evolve beyond mobile phones – Market overview
*Dinesh Kithany*
IHS Markit, United Kingdom

*Huan Zhang*, *Shihui Xu*, *Chen Yao*, *Houjun Tang*
1Shanghai Jiao Tong University, China

11:40  **Separated Circular Capacitive Couplers for Rotational Misalignment of Drones**
*Chanjun Park*, *Jaehyoung Park*, *Yujun Shin*, *Sungryul Huh*, *Jangwook Kim*, *Seungyoung Ahn*
1KAIST, South Korea

11:55  **Coil Design for High Coupling Performance for Two-phase Receiver of Dynamic Wireless Charging System**
*Zhiyuan Wang*, *Jiantao Zhang*, *Tianhao Huang*, *Shumei Cui*
1Harbin Institute of Technology, China

12:10 – 12:45 **WPW 2020 Announcement and Closing Ceremony**
Kelvin Lecture Theatre
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