

Monday 13 November 2017				
08:30	Registration and exhibition			
09:00	Welcome to the conference Conference Chairs: Costas Constantinou, University of Birmingham, UK and Enrica Martini, University of Siena & Wave Up Srl, Italy			
09:10	Invited Speakers Session 1 Chair: Enrica Martini, University of Siena & Wave Up Srl, Italy Modelling and Design of Millimeter and Terahertz Antennas			
	Keynote: Terahertz Antennas for Space-Borne Applications Goutam Chattopadhyay, Senior Research Scientist, NASA-Jet Propulsion Laboratory, California Institute of Technology, USA			
	Optimizing the time and frequency transfer function of photoconductive THz antennas Lluis Jofre, Professor, Universitat Politecnica de Catalunya (UPC), Barcelona, Spain			
	Advanced Antenna Architectures on THz Sensing Systems Andrea Neto, Head of the THz Sensing Group, Technical University of Delft, The Netherlands			
10:40	Refreshments, exhibition and Poster Session 1			
	Antennas and Propagation Best Papers	Antennas and Propagation Best Student Papers	Array Antennas 1	Advanced Materials 1
12:30	Lunch and exhibition			
14:00	Invited Speakers Session 2 Chair: Costas Constantinou, University of Birmingham, UK Fabrication Technology and Materials For Antennas			
	Printed Graphene Antennas: Near and Far (Field) Zhirun Hu, Senior Lecturer, National Graphene Institute, The University of Manchester, UK			
	Meta-Atoms for 3D Printing Metamaterials Darren Cadman, Project Engineer, Loughborough University, UK			
	Liquid Antennas for Radio Communications and Radar Applications Yi Huang, Professor Electrical Engineering and Electronics, University of Liverpool, UK			
15:30	Refreshments, exhibition and Poster Session 2			
	Biomedical Applications and Wearable Antennas	Communication and Sensing	Antennas and RF Circuits	Propagation 1
17:30	End of sessions			
18:45	Drinks reception			
20:00	Conference Dinner and awards presentations			
22:00	Carriages			

Monday 13 November 2017			
Poster Session 1 – 10:40			
Room 1	Room 2	Room 3	Room: AVON
Antennas and Propagation Best Paper	Antennas and Propagation Best Student Paper	Array Antennas 1	Advanced Materials 2
P1 A low-cost vector network analyzer: design and realization J Verhaevert, P Van	P8 A low-loss reconfigurable frequency selective surface based antenna	P16 SatCom on-the-move antenna with mechanically switchable circular polarization	P21 3D printed periodic structures in a horn antenna for side-lobe reduction using direct

Torre, <i>Ghent University, Belgium</i>	for direct antenna modulation S Henthorn, K Ford, T O'Farrell, <i>The University of Sheffield, UK</i>	M Ferrando-Rocher, J I Herranz-Herruzo, A Valero-Nogueira, B Bernardo-Clemente, <i>Universitat Politècnica de València, Spain</i>	metal laser sintering D Shamvedi, P O'Leary, <i>Waterford Institute of Technology, Ireland</i> , C Danilenkoff, S Karam, R Raghavendra, <i>SEAM Research Centre, Ireland/Waterford Institute of Technology, Ireland</i>
P2 Portable and low cost channel sounding platform for VHF / UHF IoT propagation research E Ball, <i>The University of Sheffield, UK</i>	P9 Specific absorption rate and efficiency of a wideband wearable monopole antenna near the human body P Rayner, W Whittow, <i>Loughborough University, UK</i>	P17 Comparative study on the diversity performance between different microstrip antenna arrays A Radhi, R Nilavalan, H Al-Raweshidy, N AbAziz, <i>Brunel University, UK</i>	P22 Vanadium dioxide switches for bandwidth reconfigurable antenna D Anagnostou, <i>Heriot Watt University, UK</i> , David Torres, N Sepulveda, <i>Michigan State University, USA</i>
P3 Metal lens for collimation of orbital angular momentum radio modes T Drysdale, <i>The Open University, UK</i> , B Allen, <i>The University of Oxford, UK</i>	P10 Radiation efficiency analysis of balanced-impedance hexaferrite substrate for antenna miniaturisation O James, G Hilton, M Beach, <i>University of Bristol, UK</i>	P18 Beam steering antenna arrays for 28-GHz applications M Nassar, <i>Port Said University, Egypt/ Sinai University, Egypt</i> , H Soliman, S Abuelenin, <i>Port Said University, Egypt</i> , A Ghoniem, <i>Ismailia University, Egypt</i>	P23 A 2.4 GHz to 27 MHz non-linear RFID topology in flexible electronics G Gentile, <i>NXP Semiconductors Germany GmbH, Germany</i> , R Ishihara, <i>Quantum Engineering Department, TU Delft, Netherlands</i>
P4 Reliable EM-driven size reduction of antennas using feasible region boundary search D Johannesson, <i>Reykjavik University, Iceland</i> , S Koziel, <i>Reykjavik University, Iceland/Gdansk University of Technology, Poland</i>	P11 Ka-band vivaldi antenna with novel core element for high-gain H Hoang, K Yang, M John, P McEvoy, M J Ammann, <i>Dublin Institute of Technology, Ireland</i>	P19 Compact and planar slot antenna array for x-band applications S Alkaraki, Y Gao, <i>Queen Mary University of London, UK</i>	P24 Analytical formulation for the capacitance of 3D square split ring resonators A Vallecchi, C Stevens, E Shamonina, <i>University of Oxford, UK</i>
P5 Concepts for a radar target simulation A Diewald, <i>IFARUS, Luxembourg</i>	P13 An inkjet-printed MMW frequency-reconfigurable antenna on a flexible PET substrate for 5G wireless systems S Fizzah Jilani, A Alomaiy, <i>Queen Mary University of London, UK</i>	P20 Dual-band compact-size antenna array for angle of arrival estimation M A G Al-Sadoon, F Abdussalam, R Abd-Alhameed, S M R Jones, I M Danjuma, <i>University of Bradford, UK</i> , I Elfergani, J Rodriguez, <i>Instituto de Telecomunicações – Aveiro, Portugal</i>	P25 Equivalent circuit analysis for 3D metamaterials with fringing field correction factor T Whittaker, W Whittow, J Vardaxoglou, <i>Loughborough University, UK</i>
P6 Laboratory testing of a SVD-based approach to recover the nonredundant bi-polar NF data from the	P14 Validation of a volume integral equation method for indoor propagation modelling I Kavanagh, C Brennan,		P26 High gain flat antennas for Ka band SATCOM F. Caminita, G Minatti, E Martini, <i>Wave Up Srl, Siena, Italy</i>

positioning error affected ones F D'Agostino, F Ferrara, C Gennarelli, R Guerriero, M Migliozi, <i>University of Salerno, Italy</i>	<i>Dublin City University, Ireland</i>		S Maci, <i>University of Siena, Italy</i>
P7 Multiband hybrid loop-notch antennas B Collins, <i>QMUL/BSC Associates Ltd, UK</i>			P27 A reconfigurable capacitive impedance surface for 1.5T magnetic resonance imaging applications I M Issa, L Ford, M Rama, J Wild, <i>The University of Sheffield, UK</i>
P7a Wireless power transfer in the presence of a conducting interface: An analytical solution A Vallecchi, C Stevens, E Shamonina, <i>University of Oxford, UK</i>			P28 Fully 3D printed GPS antenna using a low-cost open-source 3D printer A Elibiary, S Yun Jun, W Oakey, B Sanz,, <i>University of Kent, UK</i> D Bird, A Mc Clelland, <i>The Centre for Process Innovation, UK</i>
Poster Session 2 – 15:30			
Room 1	Room 2	Room 3	Room: AVON
Biomedical Applications and Wearable Antennas	Communication and Sensing	Antennas and RF Circuits	Propagation 1
P29 Miniature on skin passive UHF RFID antenna sticker V Makarovaite, A Hillier, S J Holder, C W Gourlay, J Batchelor, <i>University of Kent, UK</i>	P35 Tilt and tamper sensing UHF RFID security tag A Ziai, <i>University of Kent, UK</i> , J Batchelor, <i>The University of Sheffield, UK</i>	P44 Antennas that support multi-mode excitation C Min, N Howland, N Potts, <i>Printech Circuit Laboratories, UK</i>	P51 Implementation of a quasioptical system for free-space measurements: applications to radio astronomy O Garcia-Perez, F Tercero, S Lopez-Ruiz, B Vaquero, J Manuel Serna, <i>Spanish National Geographic Institute (IGN), Spain</i>
P30 Design and characterization of a three material anatomical bone phantom for implanted antenna applications S Symeonidis, C Panagamuwa, W Whittow, <i>Loughborough University, UK</i>	P36 Antenna characterisation and channel effects on digital systems M Almoteriy, M Sobhy, J Batchelor, <i>University of Kent, UK</i>	P45 MATLAB-based multi-objective optimization of broadband circularly polarized antennas D Warmowska, M Marek, Z Raida, <i>Brno Univerisity of Technology, The Czech Republic</i>	P52 HF urban noise level in variable channels of 3-24 kHz: a preliminary experimental approach P Bechet, S Miclaus, <i>Land Forces Academy, Romania</i> , A Bechet, <i>Technical University of Cluj-Napoca, Romania</i>
P31 Application of the MOM-GEC method to modulate the interaction phenomena between	P38 Recognising people using smart phone antennas a fuzzy biometric	P46 Combined energy harvester integrated into car seat M Kokolia, J Lacik,	P53 Testing of low-power wide-area technologies in controlled propagation

<p>human head model and a dipole antenna inside a cavity at 1.8GHz H Messaoudi, T Aguil, M Aidi, SYSCOM ENIT, Tunisia</p>	<p>S Heyes, R Edwards, Loughborough University, UK</p>	<p>Z Raida, Brno University of Technology, The Czech Republic</p>	<p>environments I Rodriguez, M Lauridsen, P Mogensen, Aalborg University, Denmark, K Arvidsson, J Kvarnstrand, M Andersson, Bluetest AB, Sweden</p>
<p>P32 Design of a miniaturized bone implantable antenna for a wireless implant monitoring device R Khokle, K Esselle, M Heimlich, D Bokor, Macquarie University, Australia</p>	<p>P39 A passive UHF RFID pH sensor (smart polymers for wireless medical sensing devices) A Hillier, V Makarovaite, J Batchelor, S J Holder, C W Gourlay, University of Kent, UK</p>	<p>P47 A CAD-oriented technique to design an optimum load impedance with multi-coupler network for class-F power amplifier B. Mohammed, R Abd-Alhameed, N Abduljabbar, I Danjuma, University of Bradford, UK I Elfergani, A S Hussaini, J Rodriguez, Instituto de Telecomunicacoes, Aveiro, Portugal</p>	<p>P54 High dynamic range frequency converters for HF and VHF propagation measurements S Feeney, SMF Designs Ltd, UK</p>
<p>P33 Effect of small wearable device antenna location on its impedance, bandwidth potential and radiation efficiency J Chen, M Berg, H Amin, A Pärssinen, University of Oulu, Finland</p>	<p>P40 Printed yagi-helix antennas W Alshrafi, C Culotta-Lopez, D Heberling, RWTH Aachen University, Germany, A Al-Bassam, RWTH Aachen, Germany</p>	<p>P48 Engineered group delay transmission lines based on novel negative group delay networks T Thatapudi, P Gardner, A Feresidis, University of Birmingham, UK</p>	<p>P55 Channel characterisation for wearable LoRaWAN monitors P Catherwood, S McComb, J McLaughlin, Ulster University, Belfast, UK, M Little, RFproximity, UK</p>
<p>P34 Robustness of 7T-MRI flexible array coil behaviour A Melis, S Casu, A Fanti, G Mazzearella, University of Cagliari, Italy, C Puddu, INFN-Genova, Italy, N Djuric, University of Novi Sad, Serbia, F Maggiorelli, A Retico, G Tiberi, 5INFN-PI, Italy</p>	<p>P41 Evaluation of carbon-fiber-reinforced plastics for automotive radar applications P Hoerner, University of Applied Sciences Esslingen, Germany, N Koch, Audi AG, Germany</p>	<p>P49 An investigation on frequency selective antenna interface based on optimization approach H Amin, J Chen, M Berg, A Pärssinen, University of Oulu, Finland</p>	<p>P57 An empirical study of link quality assessment in wireless sensor networks applicable to transmission power control protocols J Hughes, Smart Component Technologies Ltd, UK/University of Huddersfield, UK, P Lazaridis, I Glover, A Ball, University of Huddersfield, UK</p>
		<p>P50 LTCC-based millimetre-wave microstrip grid array antennas Y Zhang, Nanyang Technological University, Singapore</p>	<p>P58 Millimetre-wave propagation in urban clutter for 5G systems R Rudd, Plum Consulting LLP, UK, M Nekovee, University of Sussex, UK</p>

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09:00	Registration and exhibition
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09:15	Invited Speakers Session 3 Chair: Michael Warrington, University of Leicester, UK Trans-ionospheric propagation			
	Keynote: Ionospheric Measurement, Modelling and Simulation for Future Wideband UHF Satcoms Matthew Angling, DSTL/RAEng Chair in Space Environment and Radio Engineering, University of Birmingham, UK			
	Synthesis of real-world ionospheric effects on GPS for resilient PNT testing Talini Pinto Jayawardena, KTP Associate, Spirent Communications, University of Bath, UK			
	Impact and Mitigation of Ionospheric Scintillation Effects on GNSS Receiver Performance Marcio Aquino, Associate Professor, University of Nottingham, UK			
10:45	Refreshments, exhibition and Poster Session 3			
	Antenna Measurements and Design	Millimetre and Sub-millimetre Antennas	Array Antennas 2	Advanced Materials 2
12:30	Lunch and exhibition			
14:00	Invited Speakers Session 4 Chair: Lee Ford, University of Sheffield, UK Industry Developments			
	The Alarm™ radar antenna design and antenna data processing challenges Andrew Hume, Technical Lead for Radar & Electronic Warfare, Research and Innovation, QinetiQ, UK			
	Practical applications of small antennas in hardware platforms Brian Collins, Director, BSC Associates Ltd., UK			
	Simulation for Antenna Design and Placement in Vehicles Arnab Bhattacharya, Product Planning Manager, Senior Application Engineer, CST Computer Simul Tech GmbH, Germany			
15:30	Refreshments, exhibition and Poster Session 4			
	Biomedical Applications and Electrically Small Antennas	Propagation 2	Multiband and Wideband Antennas	Reconfigurable Antennas
17:00	Close of conference			

Tuesday 14 November 2017			
Poster Session 3 – 10:45			
Room 1	Room 2	Room 3	Room: AVON
Antenna measurements and design	Millimetre and Sub-millimetre Antennas	Array Antennas 2	Advanced Materials 2
P59 PCB-side matching networks for coaxial connectors A Diewald, S Müller, <i>IFARUS, Luxembourg</i>	P67 Study of mm-wave microstrip patch array on curved substrate Z Ahmed, K Yang, P McEvoy, M J Ammann, <i>Dublin Institute of Technology, Ireland</i>	P76 A cost-effective technique for concurrent IQ stream capture for prototyping phased arrays A Vasileiadis, E Ball, <i>The University of Sheffield, UK</i>	P82 The ultrathin reconfigurable meta-surface X Liu, A Chen, <i>Beihang University, China</i>
P60 Examination of the effect of common CATR quiet zone specifications on antenna pattern measurement uncertainties S Gregson, <i>NSI-MI, USA</i> , C Parini, <i>QMUL, UK</i>	P68 Millimetre wave reflect array antenna unit cell measurements G Ahmad, T Brown, C Underwood, <i>University of Surrey, UK</i> , T Loh, <i>National Physical Laboratory (NPL), UK</i>	P77 Single shot DoA estimation for large-array base station systems in multi-user environments T Bressner, U Johannsen, B Smolders, <i>Eindhoven University of Technology, The Netherlands</i>	P83 High gain circularly polarized meta-surface antenna A Chen, X Liu, <i>Beihang University, China</i>
P62	P69	P78	P84

<p>Nonredundant spiral NFTFF transformation for a long antenna mounted with an offset with respect to the scan sphere F D'Agostino, F Ferrara, C Gennarelli, R Guerriero, M Migliozi, <i>University of Salerno, Italy</i></p>	<p>A new THz corrugated-ground antenna D Kampoouridou, A Feresidis, <i>University of Birmingham, UK</i></p>	<p>Radiation pattern shaping for broadcasting collinear antenna array using invasive weed optimization E Tziris, J Cosmas, <i>Brunel University, UK</i>, P Lazaridis, I Glover, <i>University of Huddersfield, UK</i>, Z Zaharis, <i>Aristotle University of Thessaloniki, Greece</i></p>	<p>Optimisation of the Q factor of a complementary frequency selective surface C-K Lee, S Bukhari, J Vardaxoglou, W Whittow, <i>Loughborough University, UK</i></p>
<p>P63 Cost/performance trade-off of domain segmentation for EM-driven surrogate-assisted multi-objective antenna design A Bekasiewicz, S Koziel, <i>Reykjavik University, Iceland/Gdansk University of Technology, Poland</i></p>	<p>P70 Towards millimetre-wave antenna design for future mobile broadband networks M Rabbani, J Churm, A Feresidis, <i>University of Birmingham, UK</i></p>	<p>P79 Dual-element antenna system for hexa-band smartphone MIMO applications S Alja'afreh, <i>Mutah University, Jordan</i>, Y Huang, <i>Liverpool University, UK</i>, Q Xu, L Xing, <i>Nanjing University of Aeronautics and Astronautics, China</i>, O Saraereh, <i>Hashemite University, Jordan</i></p>	<p>P86 Artificially anisotropic cylinder to convert omnidirectional linear polarization into circular polarization E Kaivanto, E Salonen, M Berg, <i>University of Oulu, Finland</i></p>
<p>P64 Antenna design explorer: A GUI software tool for efficient antenna design optimization M Akinsolu, O Arabi, B Liu, <i>Wrexham Glyndwr University, UK</i>, F Abdussalam, R Abd-Alhameed, <i>University of Bradford, UK</i>, N Ali, Khalifa University, UAE, G Ibrahim, <i>SUE, Iraq</i>, T A Rashid, <i>UKH, Iraq</i></p>	<p>P71 Superdirective meta-arrays at telecommunication wavelengths A Vallecchi, C Stevens, E Shamonina, <i>The University of Oxford, UK</i></p>	<p>P80 Image transmission using OSTBC-encoded 16-QAM over MIMO time-selective fading channels M Lodro, S Greedy, A Vukovic, C Smart, D W P Thomas, <i>The University of Nottingham, UK</i></p>	<p>P87 Demonstrating a low temperature organic dense dielectric patch antenna R Espley-Jones, <i>Leonardo MW Ltd, UK/University College London, UK</i>, J Langley, J Dalley, <i>Leonardo MW Ltd, UK</i>, K Tong, <i>University College London, UK</i></p>
<p>P66 Parametric analysis and bandwidth optimisation of hybrid linear-exponential tapered slot vivaldi antennas I Ukaegbu, K Gamage, <i>Lancaster University, UK</i></p>	<p>P72 Characterisation of a quasi-optical transmissometer for precise measurement of a Sub-THz multenna A Sarker Andy, P Alizadeh, M Munoz Torrico, T Kreouzis, R Donnan, C Parini, R Dubrovka, <i>Queen Mary University of London, UK</i>, O Sushko, <i>Igor Sikorsky Kyiv Polytechnic Institute, Ukraine</i></p>	<p>P81 Comparative study of "Phoenix" reflectarray phase-shifting cells T Makdissy, <i>Antonine University, Lebanon</i>, R Gillard, <i>INSA of Rennes, France</i></p>	<p>P88 Metasurface synthesis using susceptibility tensors and holographic technique M Cerveny, L Ford, A Tennant, <i>University of Sheffield, UK</i></p>
	<p>P73 Role of surface waves in</p>		<p>P89 Analysis and design of</p>

	<p>the reflection properties of a millimetre wave reflectarray unit cell G Ahmad, T Brown, C Underwood, <i>University of Surrey, UK</i>, T Loh, <i>National Physical Laboratory (NPL), UK</i></p>		<p>metasurface antennas E Martini, G Minatti, F Caminita, <i>Wave Up, Italy</i>, Stefano Maci, <i>University of Siena, Italy</i></p>
	<p>P75 Design of ultra wideband vivaldi nanoantenna for solar energy collection A Yahyaoui, T Aguil, H Rmili, <i>University of Tunis El Manar</i>, N Eltresy <i>Electronic Research Institute, Egypt</i>, J Floch <i>IETR, INSA, France</i></p>		<p>P91 Properties of antennas made with sprayed selective silver metallization A Jammes, M Petisme, K Staelens, <i>Jet Metal Technologies, France</i></p>
			<p>P92 On the Introduction of Lumped Inductors for Optimizing UHF Band AMCs in Terms of Size and Angular Stability H Fernández Álvarez, M de Cos, F Las-Heras <i>Universidad de Oviedo, Gijon, Spain</i></p>
Poster Session 4 – 15:30			
Room 1	Room 2	Room 3	Room: AVON
Biomedical Applications and Electrically Small Antennas	Propagation 2	Multiband and Wideband Antennas	Reconfigurable Antennas
<p>P93 Assembly conformal antenna array for wearable microwave breast imaging application F Wang, T Arslan, <i>The University of Edinburg, UK</i></p>	<p>P101 A wideband circularly polarised cross-slot antenna with an L-shaped feed-line M Aly, Y Wang, <i>University of Greenwich, UK</i></p>	<p>P107 A printed monopole UWB antenna design with single and dual band-suppression characteristics I Elfergani, J Rodriguez, Ar Sadiq Hussaini, <i>Instituto de Telecomunicações, Portugal</i>, P Lopes, <i>Universidade de Aveiro, Portugal</i>, Raed Abd-Alhameed, <i>University of Bradford, UK</i></p>	<p>P114 Design of a novel pattern reconfigurable array antenna with beam scanning characteristic Y Ding, N Zhang, <i>Institute of China Electronic Technology Group Corporation, China</i></p>
<p>P94 Microwave apparatus for testing breast integrity based on Huygens Principle: clinical validation on 16 subjects L Sani, M Paoli, G Raspa, A Vispa, <i>Spinoff of Università di Perugia,</i></p>	<p>P102 Data processing techniques for satellite propagation measurements B Adjei-Frimpong, L Csurgai-Horváth, <i>Budapest University of Technology and Economics, Hungary</i></p>	<p>P108 High aperture efficient corrugated plate antenna at X- band S Alkaraki, Y Gao, <i>Queen Mary University of London, UK</i></p>	<p>P116 Multi-directional switched beam antenna at 2.45 GHz for WSN application A Ramachandran, S Morris, N Timmons, J Morrison, <i>Letterkenny Institute of Technology, Ireland</i>, R Raj,</p>

Italy, N Ghavami, London South Bank University, UK, G Tiberi, Imago7 Foundation, Italy, A Saracini, S Ercolani, E Vannini, M Duranti, Perugia Hospital, Italy			Government college Mananthavady, India
P97 Miniaturization of a broadband monopole antenna using low loss magneto-dielectric materials in VHF band A Kabalan, A-C Tarot, A Sharaiha, Institut d'Electronique et de Télécommunications de Rennes (IETR), France	P104 A feasibility study on the extension of the point scatterer formulation to include wind induced dynamics N Leonor, M Sánchez, Universidade de Vigo, Spain, R Caldeirinha, T Fernandes, S Rebelo, Polytechnic Institute of Leiria, Portugal/University of South Wales, UK	P109 Optimization of log-periodic dipole antenna with LTE band- rejection K Mistry, P Lazaridis, I Glover, University of Huddersfield, UK, Z Zaharis, T Xenos, Aristotle University of Thessaloniki, Greece	P117 Evidence of mainbeam steering capability of a patch Antenna with an anisotropic dielectric realised using a transmission line model W Kuhirun, P Boonek, Kasetsart University, Thailand, W Silabut, Rajamangala University of Technology Isan, Thailand
P98 Topology considerations for compact UWB antenna design S Koziel, M ul Haq, Reykjavik University, Iceland	P105 A channel model for the propagation of X-band radio waves through the solar corona A Stocker, D Siddle, M Warrington, University of Leicester, UK, G Mariotti, D Silvestri, A Zeqai, P Tortora, University of Bologna, Italy, A Argyriou, University of Thessaly, Greece, J De Vicente, R Abello, M Mercolino, ESA, Germany	P110 Size reduction of multi-band antennas using feature-based optimization S Koziel, A Bekasiewicz, Reykjavik University, Iceland/Gdansk University of Technology, Poland	P119 Design of mechanically reconfigurable meander antenna using the Galinstan liquid metal J M Floch, IETR - INSA of Rennes, France, I B Trad, IETR, France
P99 Distributive reactive nearfield parasitic element based compact CPW fed antenna for nearfield sensor applications S Raman, Bharathiar University, India, A Ramachandran, S Morris, N Timmons, J Morrison, Letterkenny Institute of Technology, Ireland		P111 A compact multiband antenna for mobile handset using characteristic modes optimization H Jaafar, S Collardey, A Sharaiha, IETR- Université de Rennes, France	P120 Development of a reconfigurable modular GPS beamformer for design and test E Lloyd, R Watson, University of Bath, UK
		P112 Characterisation of flexible, thermal transfer printed UWB antenna under static bending M Kgwadi, University of Glasgow, UK, T Drysdale, The Open University, UK	