

Measurement System for Mm-wave Integrated and Probe-fed Antennas

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List of Publications

AWARDS

[1] J. CHEN, L. YE, D. TITZ, F. GIANESELO, R. PILARD, A. CATHELIN, C. LUXEY, A.M. NIKNEJAD, “A Digitally Modulated mm-Wave Cartesian Beamforming Transmitter with Quadrature Spatial Combining”, IEEE International Solid-State Circuits Conference (ISSCC 2013), February 17-21 2013, San Francisco, USA.

2013 Jack Kilby Award for Outstanding Student Paper

[2] D. Titz, A. Bisognin, F. Ferrero, C. Luxey, G. Jacquemod, M. Valente, P. Brachat, C. Laporte, H. Ezzeddine, “60 GHz patch antenna using IPD technology”, Loughborough Antennas and Propagation Conference (LAPC), Loughborough, UK, 2012.

Best paper of the conference.

[3] D. Titz, F. Ferrero, C. Luxey, et G. Jacquemod, “A Novel Fully-Automatic 3D Radiation Pattern

Measurement Setup for 60 GHz Probe-fed Antennas”, IEEE International Symposium on Antennas and Propagation (APS), Spokane, USA, pp. 3121-3124, July 2011.

Honorable mention recipient of the student paper competition.

[4] D. Titz, M. Kyrö, C. Luxey, P. Brachat, G. Jacquemod, et P. Vainikainen, “3D Radiation Pattern

Measurement Set-up for Planar Antennas at 60 GHz”, Sophia-Antipolis MicroElectronics Forum

(SAME), Sophia-Antipolis, France, October 2010.

Winner of the Best Demo Contest Award 2010.

KEYNOTE TALKS

- [1] D. Titz, F. Ferrero, G. Jacquemod, P. Brachat, et C. Luxey, “Measurement System for Mm-wave Integrated and Probe-fed Antennas”, *Loughborough Antennas and Propagation Conference (LAPC)*, Loughborough, UK, 2012.
- [2] D. Titz, F. Ferrero, C. Luxey, P. Brachat, et G. Jacquemod, “Radiation pattern characterization of antennas at millimeter-wave frequencies”, *IEEE International Workshop on Antenna Technology (iWAT)*, Tucson, USA, pp. 311-314, March 2012.

INVITED PAPERS

- [1] D. Titz, F. Ferrero, G. Jacquemod, C. Luxey, «Design and Characterization of Antenna-in-Package for Millimeter-Wave Communications», *IEEE Singapore Section Microwave Theory & Techniques – Antennas & Propagation*, School of EEE, NTU, Singapore, 2013
- [2] F. Ferrero, D. Titz, G. Jacquemod, C. Luxey, «IPD Technology for Passive Circuits and Antennas at Millimeter-Wave Frequencies», *IEEE Singapore Section Microwave Theory & Techniques – Antennas & Propagation, School of EEE*, NTU, Singapore, 2013
- [3] A. Bisognin, F. Ferrero, D. Titz, G. Jacquemod, C. Luxey, «Characterization of Antenna-in-Package at 140 GHz», *Invited talk at Tokyo Institute of Technology*, Tokyo, Japan, March 2014

JOURNALS

- [1] D. Titz, F. Ferrero, C. Luxey, “Development of a Millimeter-wave Measurement Setup and dedicated techniques to characterize the matching and radiation performance of Probe-fed Antennas”, *IEEE Antennas and Propagation Magazine*, vol. 54, no. 4, pp. 188-203, August 2012.
- [2] D. Titz, F. Ferrero, P. Brachat, C. Luxey, G. Jacquemod, “Efficiency Measurement of Probe-Fed Antennas Operating at Millimeter-Wave Frequencies”, *IEEE Antennas and Wireless Propagation Letters*, vol. 11, pp. 1194-1197, 2012.
- [3] D. Titz, R. Pilard, F. Giancesello, F. Ferrero, C. Luxey, P. Brachat, G. Jacquemod, et D. Gloria, “Industrial HTCC SiP Solution for 60 GHz Applications”, *IEEE Antennas and Wireless Propagation Letters*, vol. 11, pp. 576-579, 2012.
- [4] D. Titz, F. Ferrero, R. Debroucke, R. Pilard, C. Luxey, F. Giancesello, S. Jan, D. Gloria, et G. Jacquemod, “Millimeter-Wave Miniaturized Hybrid Couplers Integrated on Advanced BiCMOS Technology”, *Microwave and Optical Technology Letters*, vol. 54, no. 10, pp. 2221-2223, October 2012.

- [5] D. Titz, M. Kyrö, F. Ferrero, S. Ranvier, C. Luxey, P. Brachat, G. Jacquemod, et P. Vainikainen, "Calibration Methodology for a 3D Radiation Pattern set-up of Probe-fed Millimeter-wave Antennas", *Microwave and Optical Technology Letters*, vol. 54, no. 5, pp. 1183-1189, May 2012.
- [6] D. Titz, F. Ben Abdeljelil, S. Jan, F. Ferrero, C. Luxey, P. Brachat, et G. Jacquemod, "Design and Characterization of CMOS On-Chip Antennas for 60 GHz Communications", *Radioengineering*, vol. 21, no. 1, pp.324-332, April 2012.
- [7] B. Zhang, Y. P. Zhang, D. Titz, F. Ferrero, C. Luxey, "A Circularly-Polarized Array Antenna Using Linearly-Polarized Sub Grid Arrays for Highly-Integrated 60-GHz Radio", *IEEE Transactions on Antennas and Propagation*, vol. 61, no. 1, pp. 436-439, January 2013.
- [8] Demirel, N.; Pinto, Y.; Calvez, C.; Titz, D.; Luxey, C.; Person, C.; Gloria, D.; Belot, D.; Pache, D.; Kerherve E., "Codesign of a PA–Antenna Block in Silicon Technology for 80-GHz Radar Application," *IEEE Transactions on Circuits and Systems II: Express Briefs*, vol.60, no.4, pp.177,181, April 2013
- [9] B. Zhang, D. Titz, F. Ferrero, C. Luxey, Y. P. Zhang, "Integration of Quadruple Linearly-Polarized Microstrip Grid Array Antennas for 60-GHz Antenna-in-Package Application", *IEEE Transactions on Components, Packaging and Manufacturing Technology*, vol. 3, no. 8, pp.1293,1300, Aug. 2013.
- [10] Bisognin, A.; Titz, D.; Ferrero, F.; Luxey, C.; Jacquemod, G.; Pilard, R.; Giancesello, F.; Gloria, D.; Brachat, P., "Differential feeding technique for mm-wave series-fed antenna-array", *Electronics Letters* , Vol.49, No.15, July 18 2013.
- [11] Tu Zhihong; Zhang, Y.P.; Luxey, C.; Bisognin, A.; Titz, D.; Ferrero, F., "A Ceramic Antenna for Tri-Band Radio Devices," *IEEE Transactions on Antennas and Propagation* , vol.61, no.11, pp.5776,5780, Nov. 2013.
- [12] Zhang, w.; Zhang, Y.P.; Sun, M.; Luxey, C.; Titz, D.; Ferrero, F., "A 60-GHz Circularly-Polarized Array Antenna-in-Package in LTCC Technology," *IEEE Transactions on Antennas and Propagation* , vol.61, no.12,
- [13] Titz, D.; Pilard, R.; Ferrero, F.; Giancesello, F.; Gloria, D.; Jacquemod, G.; Luxey, C., "Improved Measurement Accuracy of Probe-Fed mm-Wave Antennas Using the Three Γ Method," *IEEE Antennas and Wireless Propagation Letters* , vol.13, no., pp.103,105, 2014.
- [14] D. Titz, F. Ferrero, R. Debroucke, R. Pilard, C. Luxey, F. Giancesello, S. Jan, D. Gloria, et G. Jacquemod, "Millimeter-Wave Miniaturized Couplers Integrated on BiCMOS Technology", *Microwave and Optical Technology Letters*, vol. 56, no. 3, pp. 587-590, January 2014.

INTERNATIONAL CONFERENCES

- [1] Aimeric Bisognin, Diane Titz, Claire Laporte, Fabien Ferrero, Gilles Jacquemod, Romain Pilard, Frédéric Giancesello, Daniel Gloria, Hilal Ezzeddine, Delphine Lugara and Cyril Luxey, "Probe-fed measurement system for F-band antennas", *Accepted for EuCAP 2014*, The Hague, The Netherlands, April 2014
- [2] Sae-Won Lee, Alireza Mahanfar, Diane Titz, Fabien Ferrero, Cyril Luxey, Rodney Vaughan, Meenakshinathan Parameswaran, "Polymer MEMS Fabrication Process for System-on-Chip Self-Assembled Millimeter-Wave Antenna", *Accepted for DTIP conference*, Cannes, France, 1-4 April 2014.
- [3] Vasili Semkin, Mikko Kyrö, Antti Räisänen, Aimeric Bisognin, Fabien Ferrero, Cyril Luxey, Henri Happy, Julien Thielleux, Wei Wei, "Characterization of inkjet patch antenna on different ground planes at millimeter-wave frequencies", *Loughborough Antennas and Propagation Conference (LAPC)*, Loughborough, UK, 2013.
- [4] A. Bisognin, F. Ferrero, C. Luxey, G. Jacquemod, R. Pilard, F. Giancesello, D. Gloria, D. Titz, Patrice Brachat, "A new symmetric feeding technique for a broadband series-fed antenna-array", *IEEE International Symposium on Antennas and Propagation (APS)*, Orlando, FL, July 2013.
- [5] A. Bisognin, D. Titz, F. Ferrero, C. Luxey, G. Jacquemod, R. Pilard, F. Giancesello, D. Gloria, Claire Laporte, Hilal Ezzeddine, Patrice Brachat, "End-Fire Radiating Antenna on IPD technology for 60 GHz Communications", *IEEE International Symposium on Antennas and Propagation (APS)*, Orlando, FL, July 2013.
- [6] A. Bisognin, W. Wei, J. Thielleux, D. Titz, F. Ferrero, G. Jacquemod, P. Brachat, H. Happy, C. Luxey, "Antenna on PEN substrate for Millimeter-wave applications", *IEEE International Symposium on Antennas and Propagation (APS)*, Orlando, FL, July 2013.
- [7] Vasili Semkin, Mikko Kyrö, Veli-Matti Kolmonen, Cyril Luxey, Aimeric Bisognin, Fabien Ferrero, Henri Happy and Antti Räisänen, "Conformal Antenna Array for 60 GHz Applications", *Proc. 7th European Conf. on Antennas and Prop. (EuCAP 2013)*, Gothenburg, Sweden, 8-12 April 2013.
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- [9] A. Bisognin, D. Titz, F. Ferrero, C. Luxey, G. Jacquemod, P. Brachat, C. Laporte, H. Ezzeddine, "D-Band Quasi-Yagi Antenna in IPD Process", accepted for publication at *European Conference on Antennas and Propagation, EuCAP 2013*, Gothenburg, April 2013.
- [10] J. Chen, L. Ye, D. Titz, F. Giancesello, R. Pilard, A. Cathelin, C. Luxey, and A.M. Niknejad, "A Digitally Modulated mm-Wave Cartesian Beamforming Transmitter with

Quadrature Spatial Combining”, *IEEE International Solid-State Circuits Conference (ISSCC 2013)*, February 17-21 2013, San Francisco, USA.

[11] D. Titz, A. Bisognin, F. Ferrero, C. Luxey, G. Jacquemod, M. Valente, P. Brachat, C. Laporte, H. Ezzeddine, “60 GHz patch antenna using IPD technology”, *Loughborough Antennas and Propagation Conference (LAPC)*, Loughborough, UK, 2012. *Best paper of the conference.*

[12] D. Titz, F. Ferrero, C. Luxey, et G. Jacquemod, “A Fast and Accurate Method to Measure the Radiation Characteristics of Probe-fed Circularly-Polarized Antennas in Mm-Wave Bands”, *IEEE International Symposium on Antennas and Propagation (APS)*, Chicago, IL, July 2012.

[13] D. Titz, F. Ferrero, C. Laporte, C. Luxey, H. Ezzeddine, et G. Jacquemod, “Design of a Miniaturized Butler Matrix in IPD Process for 60 GHz Switched-Beam Antenna Arrays”, *IEEE International Symposium on Antennas and Propagation (APS)*, Chicago, IL, July 2012.

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[16] D. Titz, F. Ferrero, R. Pilard, C. Laporte, F. Giancesello, H. Ezzeddine, C. Luxey, et G. Jacquemod, “New Wideband Integrated Miniature Branchline Coupler for Beamforming Applications”, *IEEE International Microwave Symposium (MTT-S)*, Montréal, Canada, June 2012.

[17] D. Titz, F. Ferrero, C. Laporte, C. Luxey, H. Ezzeddine, et G. Jacquemod, “Antenna-in-Package in PCB and IPD Technologies for 60 GHz applications”, *European Conference on Antennas and Propagation (EuCAP)*, Prague, Czech Republic, pp. 2591-2594, April 2012.

[18] M. Kyrö, D. Titz, C. Villeneuve, V.-M. Kolmonen, C. Luxey, et P. Vainikainen, “60 GHz Membrane Antenna Array for Beam Steering Applications”, *European Conference on Antennas and Propagation (EuCAP)*, Prague, Czech Republic, pp. 2770-2774, April 2012.

[19] D. Titz, M. Kyrö, F. Ferrero, S. Ranvier, C. Luxey, P. Brachat, G. Jacquemod, et P. Vainikainen, “Measurement Setup and Associated Calibration Methodology for 3D Radiation Pattern of Probe-fed Millimeter-wave Antennas”, *Loughborough Antennas and Propagation Conference (LAPC)*, Loughborough, UK, November 2011.

[20] Pilard, D. Titz, F. Giancesello, F. Ferrero, D. Gloria, C. Luxey, et G. Jacquemod, “60 GHz HR SOI CMOS antenna for a System-on-Chip integration scheme targeting high data-rate kiosk applications”, *IEEE Int. Symp. on Antennas and Prop. (APS)*, USA, pp. 895-898, July 2011.

- [21] D. TITZ, F. FERRERO, C. LUXEY, G. JACQUEMOD, “A Novel Fully-Automatic 3D Radiation Pattern Measurement Setup for 60 GHz Probe-fed Antennas”, *IEEE International Symposium on Antennas and Propagation (APS)*, Spokane, USA, pp. 3121-3124, July 2011. **Honorable mention recipient of the student paper competition.**
- [22] D. Titz, R. Debroucke, F. Ferrero, R. Pilard, C. Luxey, F. Giancesello, D. Gloria, et G. Jacquemod, “Reflection-Type Phase Shifter Integrated on Advanced BiCMOS Technology in the 60 GHz Band”, *IEEE New Circuits & Systems Conference (NEWCAS)*, Bordeaux, France, pp. 434-437, June 2011.
- [23] D. Titz, R. Pilard, F. Ferrero, F. Giancesello, D. Gloria, C. Luxey, P. Brachat, et G. Jacquemod, “60 GHz Antenna Integrated on High Resistivity Silicon Technologies Targeting WHDMI Applications”, *IEEE Radio Frequency Integrated Circuits Symp. (RFIC)*, USA, June 2011.
- [24] R. Debroucke, A. Pottrain, D. Titz, C. Luxey, F. Giancesello, D. Gloria, et C. Gaquière, “CMOS Digital Tunable Capacitance with tuning ratio up to 13 and 10dBm linearity for Millimeter and Sub Millimeter-wave Design”, *IEEE Radio Frequency Integrated Circuits Symposium (RFIC)*, Baltimore, USA, June 2011.
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- [26] C. Oikonomopoulos-Zachos, D. Titz, M. Martinez-Vazquez, F. Ferrero, C. Luxey, et G. Jacquemod, “Accurate Characterization of a 60 GHz Antenna on LTCC Substrate”, *European Conference on Antennas and Propagation (EuCAP)*, Rome, Italy, pp. 3117-3121, April 2011.
- [27] M. Kyrö, V.-M. Kolmonen, S. Ranvier, D. Titz, C. Luxey, et P. Vainikainen, “5 x 1 Linear Antenna Array for 60 GHz Beam Steering Applications”, *European Conference on Antennas and Propagation (EuCAP)*, Rome, Italy, pp. 1258-1262, April 2011.
- [28] D. Titz, M. Kyrö, F. Ben Abdeljelil, C. Luxey, G. Jacquemod, et P. Vainikainen, “Radiation Pattern Measurement Set-up for 60 GHz On-chip Antennas”, *Loughborough Antennas and Propagation Conference (LAPC)*, Loughborough, UK, November 2010.
- [29] D. TITZ, M. KYRO, C. LUXEY, P. BRACHAT, G. JACQUEMOD, P. VAINIKAINEN, “3D radiation pattern measurement set-up for planar antennas at 60 GHz”, *Proc. International Symposium Sophia Antipolis forum of MicroElectronics (SAME 2010)*, Sophia Antipolis, France. 6-7 Octobre 2010. **Best Demo AWARD.**
- [30] D. Titz, M. Kyrö, F. Ben Abdeljelil, C. Luxey, G. Jacquemod, et P. Vainikainen, “Design and Measurement of a Dipole-antenna on a 130nm CMOS Substrate for 60GHz Communications”, *International Conference on Applied Electromagnetics and Communications (ICECom)*, Dubrovnik, Croatia, September 2010.
- [31] D. Titz, F. Ben Abdeljelil, C. Luxey, et G. Jacquemod, “Co-Design of Integrated Antennas and CMOS Switches for Future Indoor Personal Networks at 60 GHz”, *IEEE*

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COST MEETINGS

[1] D. Titz, M. Kyrö, F. Ben Abdeljelil, C. Luxey, G. Jacquemod, and P. Vainikainen, “Design and Measurement of a Dipole-antenna on a 130nm CMOS Substrate for 60GHz Communications”, *COST ASSIST Meeting, Dubrovnik, Croatia*, September 2010.

[2] D. Titz, M. Kyrö, A.E.I. Lamminen, C. Luxey, G. Jacquemod, P. Vainikainen, and J. Säily, “3D Radiation Pattern Measurement Set-Up for Planar Antennas at 60 GHz”, *COST ASSIST Meeting, Lisboa, Portugal*, February 2010.

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[2] Aimeric Bisognin, Diane Titz, Fabien Ferrero, Cyril Luxey, Gilles Jacquemod, Romain Pilard, Frédéric Giancesello, Daniel Gloria, Claire Laporte, Hilal Ezzeddine, Patrice Brachat, “Antenne in-package à rayonnement longitudinal pour standard WiGig”, *Journées Nationales Microondes (JNM)*, Paris, Juin 2013.

[3] Aimeric Bisognin, Diane Titz, Fabien Ferrero, Cyril Luxey, Gilles Jacquemod, Romain Pilard, Frédéric Giancesello, Daniel Gloria, Patrice Brachat, “Nouvelle technique d'alimentation symétrique pour réseaux d'antennes en bandes millimétriques”, *Journées Nationales Microondes (JNM)*, Paris, Juin 2013.

[4] Aimeric Bisognin, Diane Titz, Fabien Ferrero, Cyril Luxey, Gilles Jacquemod, Romain Pilard, Frédéric Giancesello, Daniel Gloria, Patrice Brachat, “Banc de caractérisation d'antennes intégrées alimentées sous pointes pour bandes de fréquences millimétriques”, *Journées Nationales Microondes (JNM)*, Paris, France, Juin 2013.

[5] Diane Titz, Fabien Ferrero, Cyril Luxey, Gilles Jacquemod, Romain Pilard, Frédéric Giancesello, Daniel Gloria, “Coupleurs hybrides miniatures large bande en technologie BiCMOS pour circuits fonctionnant à 60 GHz” *Journées Nationales Microondes (JNM)*, Paris, France, Juin 2013.

[6] Diane Titz, Fabien Ferrero, Cyril Luxey, Gilles Jacquemod, Romain Pilard, Frédéric Giancesello, Claire Laporte, Hilal Ezzeddine, Daniel Gloria, “Matrice de Butler en technologie IPD™ pour formation de faisceau à 60 GHz” *Journées Nationales Microondes (JNM)*, Paris, France, Juin 2013.

[7] Aimeric Bisognin, Diane Titz, Julien Thielleux, Wei Wei, Henri Happy, Fabien Ferrero, Cyril Luxey, Gilles Jacquemod, Patrice Brachat, “Conception et mesure d'une antenne à 60 GHz imprimée par jet d'encre sur un substrat souple PEN”, *Journées Nationales Microondes*

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[8] Aimeric Bisognin, Diane Titz, Fabien Ferrero, Cyril Luxey, Gilles Jacquemod, Romain Pilard, Frédéric Giancesello, Daniel Gloria, Claire Laporte, Hilal Ezzeddine, Patrice Brachat, “Conception et caractérisation d’antennes à 120 GHz en technologie IPDTM”, *Journées Nationales Microondes (JNM)*, Paris, France, Juin 2013.

[9] D. Titz, F. Ferrero, R. Debroucke, R. Pilard, C. Luxey, F. Giancesello, D. Gloria, et G. Jacquemod, “Déphaseur sur Substrat Silicium pour Applications en bande Millimétrique”, *Journées Nationales du Réseau Doctoral en Microélectronique (JNRDM)*, Paris, France, May 2011.

[10] D. Titz, F. Ferrero, R. Debroucke, R. Pilard, C. Luxey, F. Giancesello, D. Gloria, et G. Jacquemod, “Miniaturisation de coupleurs sur Substrat Silicium pour Applications en bande Millimétrique”, *Journées Nationales Microondes (JNM)*, Brest, France, May 2011.

[11] D. Titz, F. Ben Abdeljelil, S. Jan, F. Ferrero, C. Luxey, P. Brachat, et G. Jacquemod, “Antennes Intégrées pour des Communications à 60 GHz”, *Journées Nationales Microondes (JNM)*, Brest, France, May 2011.

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Acknowledgments

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