

LIST OF PUBLICATIONS AND PATENTS

Dr. **Antti Tölli**
25 January 2019

ARTICLES IN PEER-REVIEWED INTERNATIONAL JOURNALS AND MAGAZINES

1. H. Asgharimoghaddam, **A. Tölli**, L. Sanguinetti & M. Debbah, “Decentralizing Multicell Beamforming via Deterministic Equivalents”, *Transactions on Communications* (to appear), 2019
2. **A. Tölli**, H. Ghanch, J. Kaleva, P. Komulainen, M. Bengtsson, M. Skoglund, M. Honig, E. Lähetkangas, E. Tirola and K. Pajukoski, “Distributed Coordinated Transmission with Forward-Backward Training for 5G Radio Access”, *IEEE Communications Magazine*, vol. 57, no. 1, pp. 58-64, January 2019.
3. D. Kumar, J. Saloranta, J. Kaleva, G. Destino, **A. Tölli**, ”Reliable Positioning and mmWave Communication via Multi-Point Connectivity.” *Sensors* 18, no. 11: 4001, 2018.
4. P. Jayasinghe, **A. Tölli**, J. Kaleva & M. Latva-aho, “Bi-directional Beamformer Training for Dynamic TDD Networks”, *Transactions on Signal Processing*, vol. 66, no. 23, pp. 6252-6267, 1 Dec.1, 2018.
5. E. S. Lohan, M. Koivisto, O. Galinina, S. Andreev, **A. Tölli**, G. Destino, M. Costa, K. Leppänen, Y. Koucheryavy, and M. Valkama, ”Benefits of Positioning-Aided Communication Technology in High-Frequency Industrial IoT”, *IEEE Communications Magazine*, vol. 56, no. 12, pp. 142-148, December 2018.
6. J. Kaleva, **A. Tölli**, M. Juntti, R. Berry, and M. Honig, “Decentralized Joint Precoding with Pilot Aided Beamformer Estimation,” *IEEE Transactions on Signal Processing*, vol. 66, no. 9, pp. 2330-2341, May 2018.
7. G. Venkatraman, **A. Tölli**, M. Juntti & L-N. Tran, “Multigroup Multicast Beamformer Design for MISO-OFDM With Antenna Selection”, *IEEE Transactions on Signal Processing*, vol. 65, no. 22, pp. 5832-5847, November 2017
8. O. Tervo, **A. Tölli**, M. Juntti & L-N. Tran, “Energy-Efficient Beam Coordination Strategies with Rate Dependent Processing Power”, *IEEE Transactions on Signal Processing*, vol. 65, no 22, pp. 6097 – 6112, November 2017
9. G. Fodor, N. Rajatheva, W. Zirwas, L. Thiele, M. Kurras, K. Guo, **A. Tölli**, J. H. Sorensen, E. de Carvalho, “An Overview of Massive MIMO Technology Components in METIS”, *IEEE Communications Magazine*, vol. 55, no. 6, June, 2017
10. G. Venkatraman, **A. Tölli**, M. Juntti & L-N. Tran, “Traffic Aware Resource Allocation Schemes for Multi-Cell MIMO-OFDM Systems”, *IEEE Transactions on Signal Processing*, vol. 64, no. 11, pp. 2730–2745, June 2016.
11. J. Kaleva, **A. Tölli** & M. Juntti, “Decentralized Sum Rate Maximization with QoS Constraints for Interfering Broadcast Channel via Successive Convex Approximation”, *IEEE Transactions on Signal Processing*, vol. 64, no. 11, pp. 2788–2802, June 2016.
12. H. Pennanen, **A. Tölli**, J. Kaleva, P. Komulainen & M. Latva-aho, “Decentralized Linear Transceiver Design and Signaling Strategies for Sum Power Minimization in Multi-Cell MIMO Systems” *IEEE Transactions on Signal Processing*, vol. 64, no. 7, pp. 1729–1743, April 2016.
13. V. Tervo, **A. Tölli** & T. Matsumoto, “PAPR Constrained Power Allocation for Multicarrier Transmission in Multiuser SIMO Communications”, *IEEE Transactions on Wireless Communications*, vol. 15, no. 4, pp. 2458–2473, April 2016.

14. T. Lakshmana, **A. Tölli** and T. Svensson, "Improved Local Precoder Design for JT-CoMP with Periodical Backhaul CSI Exchange" IEEE Communications Letters, vol. 20, no. 3, pp. 566-569, March 2016.
15. T. Lakshmana, **A. Tölli**, R. Devassy and T. Svensson, "Precoder Design with Incomplete Feedback for Joint Transmission", IEEE Transactions on Wireless Communications, vol. 15, no. 3, pp. 1923-1936, March 2016.
16. V. Tervo, **A. Tölli**, J. Karjalainen & T. Matsumoto, "Convergence Constrained Multiuser Transmitter-Receiver Optimization in Single Carrier FDMA", IEEE Transactions on Signal Processing, vol. 63, no. 6, pp. 1500-1511, March 2015
17. Q. Sun, L. Lihua, **A. Tölli**, M. Juntti & J. Mao, "Optimal Energy Efficient Bit and Power Loading for Multicarrier Systems", IEEE Communications Letters, vol.18, no.7, pp.1194-1197, July 2014
18. F. Hanif, L. Tran, **A. Tölli** & M. Juntti, "Computationally Efficient Robust Beamforming for SINR Balancing in Multicell Downlink With Applications to Large Antenna Array Systems", IEEE Transactions on Communications, vol. 62, no. 6, pp. 1908-1920, June 2014
19. H. Pennanen, **A. Tölli** & M. Latva-aho, "Decentralized Robust Beamforming for Coordinated Multi-Cell MISO Networks", IEEE Signal Processing letters, vol. 21, no. 3, pp. 334 - 338, March 2014
20. H. Pennanen, **A. Tölli** & M. Latva-aho, "Multi-Cell Beamforming with Decentralized Coordination in Cognitive and Cellular Networks", IEEE Transactions on Signal Processing, vol. 62, no. 2, pp. 295 - 308, January 2014
21. X. Lu, **A. Tölli**, L. N. Tran & M. Juntti, "Resource Allocation in Coordinated Uplink Multicell Multicarrier Systems", IEEE Transactions on Communications, 2013, vol. 61, no. 12, pp. 4922 - 4933, December 2013
22. M. F. Hanif, L. N. Tran, **A. Tölli** and M. Juntti, "Efficient Solutions for Weighted Sum Rate Maximization in Multicellular Networks With Channel Uncertainties", IEEE Transactions on Signal Processing, vol. 61, no. 22, pp. 5659 - 5674, November 2013
23. X. Lu, **A. Tölli** & M. Juntti, "A Novel Scheme For Sum Power Minimization in MIMO MAC Multicarrier Systems", IEEE Communications Letters, vol. 17, no. 9, pp. 1730 - 1733, September 2013
24. P. Komulainen, **A. Tölli** & M. Juntti, "Effective CSI Signaling and Decentralized Beam Coordination in TDD Multi-Cell MIMO Systems", IEEE Transactions on Signal Processing, vol. 61, no. 9, pp. 2204 - 2218, May 2013
25. J. Kaleva, **A. Tölli**, G. Venkatraman & M. Juntti, "Downlink Precoder Design for Coordinated Regenerative Multi-User Relaying", IEEE Transactions on Signal Processing, vol. 61, no. 5, pp. 1215 - 1229, March 2013
26. J. Kaleva, P. Komulainen, M. Juntti & **A. Tölli**, "Zero-Forcing Spatial Interweave with Greedy Scheduling" (**invited paper**), Wireless Personal Communications, Volume 72, Issue 3, pp. 1649-1662, October 2013
27. L. N. Tran, M. F. Hanif, **A. Tölli** & M. Juntti, "Fast converging algorithm for weighted sum rate maximization in multicell MISO downlink," IEEE Signal Processing Lett., vol. 19, no. 12, pp. 872-875, December 2012
28. K. Fukawa, S. Ormsub, **A. Tölli**, K. Anwar & T. Matsumoto, "EXIT-constrained BICM-ID Design Using Extended Mapping", EURASIP Journal on Wireless Communications and Networking, Vol. 2012, No. 40, 17 pages, February 2012

29. H. Pennanen, **A. Tölli** & M. Latva-aho, “Decentralized Coordinated Downlink Beamforming via Primal Decomposition”, *IEEE Signal Processing Letters*, vol. 8, no.11, pp. 647 - 650, November 2011
30. J. Karjalainen, M. Codreanu, **A. Tölli**, M. Juntti & T. Matsumoto, "EXIT Chart-Based Power Allocation for Iterative Frequency Domain MIMO Detector," *IEEE Transactions on Signal Processing*, vol. 59, no.4, pp.1624-1641, April 2011
31. X. Lu, W. Li, **A. Tölli** & M. Juntti, “Adaptive Coordinated Reception for Multicell MIMO Uplink”, Special issue of the *EURASIP Journal on Advances in Signal Processing* devoted to Cooperative MIMO Multicell Networks, vol. 2011, Article ID 195309, 11 pages, 2011
32. **A. Tölli**, H. Pennanen, and P. Komulainen, “Decentralized Minimum Power Multi-cell Beamforming with Limited Backhaul Signalling”, *IEEE Trans. on Wireless Comm.*, vol. 10, no. 2, pp. 570 - 580, February 2011
33. P. Komulainen, **A. Tölli**, M. Latva-aho & M. Juntti, “Downlink Assisted Uplink Zero-Forcing for TDD Multiuser MIMO Systems”, Special issue of the *Eurasip Journal on Wireless Communications & Networking* devoted to the 3GPP Long-Term Evolution System, Article ID 894726, Vol. 2009, September 2009
34. A. Osseiran, E. Hardouin, A. Gouraud, M. Boldi, I. Cosovic, K. Gosse, J. Luo, J. F. Monserrat, T. Svensson, **A. Tölli**, A. Mihovska, S. Redana, M. Werner and W. Mohr, “The Road to IMT-Advanced Communication Systems: State-of-the-Art and Innovation Areas Addressed by the WINNER+ Project”, *IEEE Communications Magazine Special Issue on ‘Next Generation 3GPP Technologies’*, Vol. 47, No. 6, pp. 38 – 47, June 2009
35. **A. Tölli**, M. Codreanu & M. Juntti, “Linear Multiuser MIMO Transceiver Design with Quality of Service and Per Antenna Power Constraints”, *IEEE Transactions on Signal Processing*, vol. 56, no. 7, pp. 3049 – 3055, July 2008
36. **A. Tölli**, M. Codreanu & M. Juntti, “Cooperative MIMO-OFDM Cellular System with Soft Handover between Distributed Base Station Antennas”, *IEEE Transactions on Wireless Communications*, Vol. 7, No. 4, pp. 1428 – 1440, April 2008
37. M. Codreanu, **A. Tölli**, M. Juntti & M. Latva-aho, “Joint Design of Tx-Rx Beamformers in MIMO Downlink Channel”, *IEEE Transactions on Signal Processing*, Vol. 55, No. 9, pp. 4639 – 4655, September 2007
38. **A. Tölli**, M. Codreanu & M. Juntti, “Compensation of Non-Reciprocal Interference in Adaptive MIMO-OFDM Cellular Systems”, *IEEE Transactions on Wireless Communications*, Vol. 6, No. 2, pp. 545 – 555, February 2007

ARTICLES SUBMITTED

39. A. Arvola, **A. Tölli** & D. Gesbert, “Power Efficient Transmit Waveform Shaping for PAPR Reduction in MIMO-OFDM”, submitted to *IEEE Transactions on Wireless Communications*, June 2018

INTERNATIONAL PEER-REVIEWED CONFERENCE PUBLICATIONS

40. A. Padmanabhan & **A. Tölli**, “An Iterative Approach for Inter-Group Interference Management in Two-Stage Precoder Design” in *Proc. IEEE Globecom 2018*, Abu Dhabi, UAE, December, 2018
41. J. Saloranta, G. Destino, **A. Tölli** & H. Wymeersch, “Novel Solution for Multi-Connectivity 5G-mmW Positioning”, in *Proc. Annual Asilomar Conf. Signals, Syst., Comp.*, Pacific Grove, CA, USA, Oct 2018

42. **A. Tölli**, J. Kaleva, P. Shariatpanahi, B. H. Khalaj, "Linear Multicast Beamforming Schemes for Coded Caching", in Proc. Annual Asilomar Conf. Signals, Syst., Comp., Pacific Grove, CA, USA, Oct 2018
43. D. Kumar, J. Saloranta, G. Destino and **A. Tölli**, "On Trade-off Between 5G Positioning and mmWave Communication in a Multi-user Scenario," 8th International Conference on Localization and GNSS (ICL-GNSS), Guimaraes, Portugal, 2018, pp. 1-5.
44. A. Padmanabhan & **A. Tölli**, "Interference Management via User Clustering in Two-Stage Precoder Design" in Proc. IEEE SPAWC 2018, Kalamata, Greece, June, 2018
45. M. Majidzadeh, J. Kaleva, N. Tervo, H. Pennanen, **A. Tölli** & M. Latva-aho, "Rate Maximization for Partially Connected Hybrid Beamforming in Single-User MIMO Systems" in Proc. IEEE SPAWC 2018, Kalamata, Greece, June, 2018
46. **A. Tölli**, J. Kaleva, P. Shariatpanahi, B. H. Khalaj, "Multicast Beamformer Design for Coded Caching", in Proc. International Symposium on Information Theory (ISIT), Vail, CO, USA, June 2018
47. **A. Tölli**, J. Kaleva, P. Shariatpanahi, B. H. Khalaj, "Multicast Mode Selection for Multi-antenna Coded Caching", in Proc. The 2018 International Workshop on Content Caching and Delivery in Wireless Networks (CCDWN), Shanghai, China, May 2018
48. J. Kaleva, **A. Tölli** & M. Juntti, "Fast Converging Decentralized WSRMax for MIMO IBC with Low Computational Complexity", in Proc. IEEE CAMSAP, Curacao, December 2017
49. J. Kaleva, **A. Tölli**, M. Juntti, R. Berry, & M. Honig, "Decentralized Joint Precoding for WSRMax with Pilot Aided Beamformer Estimation", in Proc. IEEE Global Telecommun. Conf. (GLOBECOM), Singapore, December 2017
50. J. Kaleva, **A. Tölli**, M. Juntti, R. Berry, & M. Honig, "Gradient Based Decentralized Joint Beamforming", in Proc. IEEE PIMRC, Montreal, Canada, October 2017
51. M. Majidzadeh, A. Moilanen, N. Tervo, H. Pennanen, **A. Tölli**, M. Latva-aho, "Partially connected hybrid beamforming for large antenna arrays in multi-user MISO systems", in Proc. IEEE PIMRC, Montreal, Canada, October 2017
52. P. Jayasinghe, **A. Tölli**, J. Kaleva & M. Latva-aho, "Direct Beamformer Estimation for Dynamic TDD Networks with Forward-Backward Training" in Proc. IEEE SPAWC 2017, Sapporo, Japan, July, 2017
53. P. Jayasinghe, **A. Tölli**, J. Kaleva & M. Latva-aho, "Traffic Aware Pilot Decontamination for Multi-Cell MIMO Systems" in Proc. EuCNC 2017, Oulu, Finland, June, 2017
54. A. Arvola, **A. Tölli** & D. Gesbert, "Rate Maximization via PAPR Reduction in MIMO-OFDM Uplink: a User Cooperation Approach", in Proc. IEEE International Conference on Communications (ICC) 2017, Paris, France, May, 2017
55. G. Venkatraman, **A. Tölli**, J. Kaleva, M. Juntti, "JP-CoMP with Antenna Selection for Multi-Carrier C-RAN with Finite Backhaul Capacity", in Proc. IEEE International Conference on Communications (ICC) 2017, Paris, France, May, 2017
56. H. Asgharimoghaddam, **A. Tölli**, L. Sanguinetti & M. Debbah, "Deterministic Equivalent for Max-Min SINR over Random User Locations", in Proc. IEEE International Conference on Communications (ICC) 2017, Paris, France, May, 2017
57. M. Bande, V. Veeravalli, **A. Tölli** & M. Juntti, "DoF Analysis in a Two-Layered Heterogeneous Wireless Interference Network", in Proc. IEEE ICASSP 2017, New Orleans, USA, March, 2017

58. **A. Tölli**, J. Kaleva, G. Venkatraman & D. Gesbert, "Joint UL/DL Mode Selection and Transceiver Design for Dynamic TDD Systems", in Proc. IEEE Global Conference on Signal and Information Processing (GlobalSIP), Washington D.C., USA, Dec 7-9, 2016
59. G. Venkatraman, **A. Tölli**, J. Kaleva, M. Juntti, "Transmit Beamformer and Quantization Design for Multi-Carrier CRAN CoMP", in Proc. IEEE Global Conference on Signal and Information Processing (GlobalSIP), Washington D.C., USA, Dec 7-9, 2016
60. A. Arvola, **A. Tölli** & D. Gesbert, "A User Cooperative Beamforming Approach to PAPR Reduction in MIMO-OFDM Uplink", in Proc. Annual Asilomar Conf. Signals, Syst., Comp., Pacific Grove, CA, USA, Nov 2016
61. A. Mubarak, J. Kaleva & **A. Tölli**, "Dynamic Clustering for Max-Min Fairness with Joint Processing CoMP", in Proc. IEEE PIMRC 2016, Valencia, Spain, Sept. 2016
62. A. Arvola, **A. Tölli** & D. Gesbert, "Two-layer Precoding for Dimensionality Reduction in Massive MIMO", in Proc. EUSIPCO., Budapest, Hungary, Aug 2016
63. G. Venkatraman, **A. Tölli**, M. Juntti & L-N. Tran, "Queue Aware Precoder Design via OTA Training", in Proc. 2016 IEEE 17th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC), Edinburgh, UK, July 3-6, 2016
64. J. Kaleva, M. Bande, **A. Tölli**, M. Juntti & V. Veeravalli, "Sum Rate Maximizing Joint Processing with Limited Backhaul and Tree Topology Constraints", in Proc. 2016 IEEE 17th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC), Edinburgh, UK, July 3-6, 2016
65. O. Tervo, **A. Tölli**, M. Juntti & L-N. Tran, "Energy-Efficient Coordinated Beamforming with Rate Dependent Processing Power", in Proc. 2016 IEEE 17th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC), Edinburgh, UK, July 3-6, 2016
66. A. Padmanabhan, **A. Tölli**, M. Juntti & L-N. Tran, "Precoder Design for MU-MISO Transmission with Guaranteed QoS Constraints", in Proc. European Wireless, Oulu, Finland, May 2016
67. G. Venkatraman, **A. Tölli**, M. Juntti & L-N. Tran, "Multi-Group Multicast Beamformer Design for MIMO-OFDM Transmission", in Proc. European Wireless, Oulu, Finland, May 2016
68. H. Asgharimoghaddam, **A. Tölli**, L. Sanguinetti & M. Debbah, "Decentralized Multi-cell Beamforming with QoS Guarantees Via Large System Analysis", Proc. IEEE CAMSAP, Acapulco, Mexico, Dec 2015
69. O. Raeesi, Y. Zou, **A. Tölli**, M. Valkama, "On the Effects of UE Transceiver Non-Reciprocity in Coordinated TDD Multi-Cell MIMO Network", in Proc. IEEE Global Telecommun. Conf., San Diego, USA, December 2015
70. J. Kaleva, **A. Tölli**, M. Juntti, R. Berry, & M. Honig, "Decentralized Coherent Coordinated Multi-Point Transmission for Weighted Sum Rate Maximization", in Proc. IEEE Global Telecommun. Conf., San Diego, USA, December 2015
71. J. Kaleva, **A. Tölli**, M. Juntti, "Successive Convex Approximation for Simultaneous Linear TX/RX Design in MIMO BC", in Proc. Annual Asilomar Conf. Signals, Syst., Comp., Pacific Grove, CA, USA, Nov. 2015
72. J. Kaleva, **A. Tölli**, M. Juntti, "Rate Constrained Decentralized Beamforming for MIMO Interfering Broadcast Channel", in Proc. IEEE PIMRC 2015, Hong Kong, Sept. 2015

73. P. Jayasinghe, **A. Tölli**, J. Kaleva & M. Latva-aho, "Bi-directional Signaling Strategies for Dynamic TDD Networks" in Proc. IEEE SPAWC 2015, Stockholm, Sweden, July, 2015
74. P. Jayasinghe, **A. Tölli**, J. Kaleva & M. Latva-aho, "Bi-directional Signaling for Dynamic TDD with Decentralized Beamforming" in Proc. IEEE ICC 2015 SmallNets Workshop, London, UK, June, 2015
75. **A. Tölli**, J. Kaleva & P. Komulainen, "Mode Selection and Transceiver Design for Rate Maximization in Underlay D2D MIMO Systems", in Proc. IEEE ICC 2015, London, UK, June, 2015
76. A. Ghazanfari, J. Kaleva & **A. Tölli**, "Joint Power Loading and Mode Selection for Network-assisted Device-to-Device Communication", in Proc. IEEE ICC 2015, London, UK, June, 2015
77. P. Komulainen & **A. Tölli** "Coordinated Multi-Antenna Processing for Cellular Underlay Device-to-Device Communication", in Proc. 1st International Conference on 5G for Ubiquitous Connectivity, Levi, Finland, Nov 2014
78. Q. Sun, L. Lihua, M. Juntti, J. Mao & **A. Tölli** "Energy Efficient Bit and Power Loading for OFDM-based Two-Way Relay Systems", in Proc. IEEE Global Telecommun. Conf., Austin, USA, December 2014
79. O. Raeesi, Y. Zou, **A. Tölli**, M. Valkama, "Closed-form Analysis of Channel Non-Reciprocity Due to Transceiver and Antenna Coupling Mismatches in Multi-user Massive MIMO Network", in Proc. Globecom 2014 Workshop - Massive MIMO: From Theory to Practice, Austin, USA, December 2014
80. P. Komulainen & **A. Tölli**, "Coordinated Multi-Antenna Processing for Cellular Underlay Device-to-Device Communication", 1st International Conference on 5G for Ubiquitous Connectivity, Levi, Finland, November 2014
81. Y. Zou, O. Raeesi, R. Wichman, **A. Tölli**, M. Valkama, "Analysis of Channel Non-reciprocity due to Transceiver and Antenna Coupling Mismatches in TDD Precoded Multi-user MIMO-OFDM Downlink", VTC fall'14, Vancouver, Canada
82. H. Asgharimoghaddam, **A. Tölli** & N. Rajatheva, "Decentralized Multi-cell Beamforming Via Large System Analysis in Correlated Channels" in Proc. EUSIPCO 2014, Lisbon, Portugal, September 2014
83. G. Venkatraman, **A. Tölli** & M. Juntti, "Low Complexity Multiuser MIMO Scheduling for Weighted Sum Rate Maximization", in Proc. EUSIPCO 2014, Lisbon, Portugal, September 2014
84. H. Asgharimoghaddam, **A. Tölli** & N. Rajatheva, "Decentralizing the Optimal Multi-cell Beamforming via Large System Analysis", in Proc. IEEE ICC 2014, Sydney, Australia, June, 2014
85. V. Tervo, **A. Tölli**, J. Karjalainen & T. Matsumoto, "PAPR Constrained Power Allocation for Iterative Frequency Domain Multiuser SIMO Detector", in Proc. IEEE ICC 2014, Sydney, Australia, June, 2014
86. A. Ghazanfari, **A. Tölli** & H. Pennanen, "Sum Power Minimization for Cellular Systems with Underlay D2D Communications", in Proc. CrownCom, Oulu, Finland, June, 2014
87. J. Kaleva, R. Berry, M. Honig, **A. Tölli** & M. Juntti, "Decentralized Sum MSE Minimization for Coordinated Multi-Point Transmission", in Proc. IEEE ICASSP 2014, Florence, Italy, May, 2014

88. G. Venkatraman, **A. Tölli**, L. N. Tran & M. Juntti, "Queue Aware Precoder Design for Space Frequency Resource Allocation", in Proc. IEEE ICASSP 2014, Florence, Italy, May, 2014
89. V. Tervo, **A. Tölli**, J. Karjalainen & T. Matsumoto, "Transmission Power Variance Constrained Power Allocation for Iterative Frequency Domain Multiuser SIMO Detector", in Proc. IEEE ICASSP 2014, Florence, Italy, May, 2014
90. H. Pennanen, **A. Tölli** & M. Latva-aho, "Robust Beamforming with Decentralized Interference Coordination in Cognitive Radio Networks", in Proc. IEEE ICASSP 2014, Florence, Italy, May, 2014
91. X. Lu, **A. Tölli**, L. Anttila, M. Juntti, M. Valkama, "Multiuser Frequency Allocation with Wideband Power Amplifier Models", in Proc. IEEE ICASSP 2014, Florence, Italy, May, 2014
92. V. Tervo, **A. Tölli**, J. Karjalainen & T. Matsumoto, "PAPR Constrained Power Allocation for Iterative Frequency Domain Multiuser SIMO Detector", in Proc. IEEE ICC 2014, Sydney, Australia, June, 2014
93. G. Venkatraman, **A. Tölli**, J. Janhunen & M. Juntti, "Iterative Scheduling for Cell-Edge in Multi-Cell MU-MIMO", in Proc. 2013 IEEE GlobalSIP Symposium on Optimization in Machine Learning and Signal Processing, Austin, Texas, USA, Dec. 2013
94. J. Kaleva, **A. Tölli** & M. Juntti, "Decentralized Joint Beamforming and Scheduling for Weighted Sum Rate Maximization," in Proc. Annual Asilomar Conf. Signals, Syst., Comp., Pacific Grove, CA, USA, Nov. 2013
95. J. Kaleva, **A. Tölli** & M. Juntti, "Decentralized Beamforming for Weighted Sum Rate Maximization with Rate Constraints", in Proc. IEEE PIMRC 2013 - Workshop on Cooperative and Heterogeneous Cellular Networks, London, UK, Sep. 2013
96. X. Lu, **A. Tölli** & M. Juntti, "A Fast Converging Algorithm for Sum Power Minimization in MIMO Uplink", in Proc. IEEE PIMRC 2013, London, UK, Sep. 2013
97. J. Kaleva, **A. Tölli** & M. Juntti, "Primal Decomposition based Decentralized Weighted Sum Rate Maximization with QoS Constraints for Interfering Broadcast Channel", in Proc. IEEE SPAWC 2013, Darmstadt, Germany, June, 2013
98. J. Kaleva, **A. Tölli** & M. Juntti, "User Admission for Multi-User Regenerative Relay MIMO Systems", in Proc. IEEE ICC 2013, Budapest, Hungary, June, 2013
99. H. Pennanen, **A. Tölli** & M. Latva-aho, "Decentralized linear transceiver design in coordinated multi-cell multiuser MIMO systems," in Proc. IEEE Global Telecommun. Conf., Anaheim, CA, USA, Dec. 2012.
100. J. Kaleva, **A. Tölli** & M. Juntti, "Weighted sum rate maximization for interfering broadcast channel via successive convex approximation," in Proc. IEEE Global Telecommun. Conf., Anaheim, CA, USA, Dec. 2012.
101. H. Pennanen, **A. Tölli** & M. Latva-aho, "Pragmatic multi-cell MIMO beamforming with decentralized coordination," in Proc. Annual Asilomar Conf. Signals, Syst., Comp., Pacific Grove, CA, USA, Nov. 2012.
102. V. Tervo, **A. Tölli**, J. Karjalainen & T. Matsumoto, "On convergence constraint precoder design for iterative frequency domain multiuser siso detector," in Proc. Annual Asilomar Conf. Signals, Syst., Comp., Pacific Grove, CA, USA, Nov. 2012.
103. P. Komulainen, **A. Tölli** & M. Juntti, "Low Overhead Effective CSI Signaling for Beam Coordination in TDD Multi-Cell MIMO Systems", in Proc. IEEE PIMRC 2012, Sydney, Australia, Sep., 2012

104. J. Kaleva, **A. Tölli** & M. Juntti, "Zero-Forcing Throughput Maximization for Regenerative Multi-User Relaying", in Proc. IEEE SPAWC 2012, Cesme, Turkey, June, 2012
105. J. Kaleva, **A. Tölli**, G. Venkatraman & M. Juntti, "Coordinated Downlink Precoder Design for Regenerative Multi-User Relaying", in Proc. IEEE ICC 2012, Ottawa, Canada, June, 2012
106. X. Lu, **A. Tölli** & M. Juntti, "Uplink Power Control, Subcarrier Allocation and Beamforming in Coordinated Multicell Systems", in Proc. IEEE WCNC 2012, Paris, France, Apr. 2012
107. G. Venkatraman, **A. Tölli** & M. Juntti, "User Allocation and Precoder Design for Coordinated Relaying", in Proc. IEEE Globecom 2011, Houston, USA, Dec. 2011
108. R. Mungara, **A. Tölli** & M. Juntti, "Degrees of Freedom and Interference Mitigation for MIMO Interfering Broadcast Channels", in Proc. IEEE Globecom 2011 workshop on Multicell Cooperation, Houston, USA, Dec. 2011
109. H. Pennanen, **A. Tölli** & M. Latva-aho, "Decentralized Multi-Cell Beamforming Coordination for Multiuser MISO Systems" 45th Asilomar Conference on Signals, Systems and Computers, Pacific Grove, CA, USA, Nov., 2011
110. H. Pennanen, **A. Tölli** & M. Latva-aho, "Decentralized Coordinated Downlink Beamforming for Cognitive Radio Networks" IEEE PIMRC 2011, Toronto, Canada, Sep., 2011
111. P. Komulainen, **A. Tölli** & M. Juntti, "Decentralized Beam Coordination via Sum Rate Maximization in TDD Multi-cell MIMO Systems" IEEE PIMRC 2011, Toronto, Canada, Sep. 2011
112. X. Lu, **A. Tölli**, O. Piirainen, M. Juntti & W. Li, "Comparison of Antenna Arrays in a 3-D Multiuser Multicell Network", IEEE ICC 2011, Kyoto, Japan, June, 2011
113. T. Haataja, H. Pennanen, J. Leinonen, **A. Tölli** & M. Latva-aho, "Space-Frequency Scheduling in TDD Based LTE-Advanced MIMO-OFDMA Systems," Vehicular Technology Conference (VTC Spring), pp.1-5, Budapest, Hungary, May 2011
114. J. Karjalainen, M. Codreanu, **A. Tölli**, T. Matsumoto and M. Juntti, "On Greedy Based Methods for EXIT Chart Based Transmission Power Allocation", IEEE Global Communications Conference (IEEE GLOBECOM 2010), Miami, Florida, USA, Dec., 2010
115. H. Pennanen, T. Haataja, J. Leinonen, **A. Tölli**, M. Latva-aho, "System Level Evaluation of TDD based LTE-Advanced MIMO-OFDMA Systems", IEEE Globecom 2010, Miami, USA, Nov. 2010
116. P. Komulainen and **A. Tölli** and M. Juntti, "CSI Signaling for Decentralized Coordinated Beamforming in TDD Multi-cell MIMO Systems", 44th Asilomar Conference on Signals, Systems and Computers, Pacific Grove, CA, USA, November, 2010
117. X. Lu, W. Li, **A. Tölli**, M. Juntti, O. Piirainen and E. Kunnari, "Joint Power Control, Receiver Beamforming and Adaptive Multi Base Station Coordination for Uplink Wireless Communications", The 21st Personal, Indoor and Mobile Radio Communications Symposium 2010 (PIMRC'10), Istanbul, Turkey, September, 2010
118. E. Suikkanen, **A. Tölli** and M. Latva-aho, "Characterization of Propagation in an Outdoor-to-Indoor Scenario at 780 MHz", The 21st Personal, Indoor and Mobile Radio Communications Symposium 2010 (PIMRC'10), Istanbul, Turkey, September, 2010

119. A. Osseiran, M. Boldi, J. F. Monserrat, J. Vihriälä, **A. Tölli**, A. Gouraud, “Radio Enabling Techniques for IMT-Advanced (4G) and beyond: WINNER+ Project”, European Wireless Technology Conference (EuWIT’10), Paris France, September 2010
120. L. Wei, M. Juntti, X. Lu, **A. Tölli**, E. Kunnari & O. Piirainen, “Adaptive joint multi-cell reception with uplink power control and beamforming”. Proceedings of 5th ICST Conference on Communications and Networking in China (ChinaCom) 2010, **invited paper**, Beijing, China, Aug., 2010, 6 pages
121. K. Fukawa, D. Zhao, **A. Tölli** & T. Matsumoto, “Irregular Repetition and Single Parity Check Coded BICM-ID using Extended Mapping”, IEEE Communications and Networking in China (ChinaCom) 2010, **invited paper**, Beijing, Aug., 2010
122. H. Pennanen, **A. Tölli** and M. Latva-aho, “Decentralized Base Station Assignment in Combination with Downlink Beamforming”, IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC), Marrakech, Morocco, June, 2010
123. A. Osseiran, M. Boldi, A. Gouraud, J. F. Monserrat, **A. Tölli** & J. Vihriälä, “Refined Radio Innovation Areas for IMT-Advanced within the WINNER+ Project”, Future Network and MobileSummit 2010, Florence, Italy, June 2010
124. M. Boldi, E. Hardouin, M. Olsson, **A. Tölli**, H. Pennanen, “Coordinated Beamforming for IMT-Advanced in the Framework of WINNER+ Project”, Future Network and MobileSummit 2010, Florence, Italy, June 2010
125. P. Komulainen, **A. Tölli**, B. Song, F. Roemer, E. Björnson, M. Bengtsson, “CSI Acquisition Concepts for Advanced Antenna Schemes in the WINNER+ Project”, Future Network and MobileSummit 2010, Florence, Italy, June 2010
126. **A. Tölli**, H. Pennanen and P. Komulainen, “Distributed Coordinated Multi-cell Transmission Based on Dual Decomposition”, IEEE Global Communications Conference (IEEE GLOBECOM 2009), Honolulu, Hawai’i, USA, December 2009
127. J. Karjalainen, **A. Tölli**, M. Codreanu and T. Matsumoto, “Power allocation for irregularly modulated MIMO signaling with iterative frequency domain detector”, 43th Asilomar Conference on Signals, Systems and Computers, Pacific Grove, CA, USA, Nov., 2009
128. **A. Tölli**, H. Pennanen and P. Komulainen, “Distributed Implementation of Coordinated Multi-cell Beamforming”, The 20th Personal, Indoor and Mobile Radio Communications Symposium 2009 (PIMRC’09), Tokyo, Japan, September 2009
129. **A. Tölli**, H. Pennanen and P. Komulainen, “Beamformer Design and Resource Allocation for Centralised and Distributed Coordinated Multi-point Transmission”, The 12th International Symposium on Wireless Personal Multimedia Communications (WPMC), **Invited paper**, Sendai, Japan, September 2009
130. J. Karjalainen, **A. Tölli**, T. Matsumoto, M. Juntti “On Convergence Constrained Precoder Design for Iterative Frequency Domain MIMO Detector”, IEEE International Symposium on Information Theory (ISIT), Seoul, Korea, July 2009
131. **A. Tölli**, H. Pennanen and P. Komulainen, “On the Value of Coherent and Coordinated Multi-cell Transmission”, The International Workshop on LTE Evolution in conjunction with the International Conference on Communications (ICC’09), Dresden, Germany, June 2009
132. A. Osseiran, E. Hardouin, M. Boldi, I. Cosovic, J. F. Montserrat, **A. Tölli**, “Radio Innovation Areas for IMT-Advanced & Beyond: WINNER+System Concept”, Future Network and MobileSummit 2009, Santander, Spain, June 2009

133. M. Boldi, P. Komulainen, M. Olsson, H. Pennanen, N. Seifi, T. Svensson, **A. Tölli**, T. Wild, “Coordinated MultiPoint Systems for IMT-Advanced in the Framework of the WINNER+ Project”, ICT MobileSummit 2009, Santander, Spain, June 2009
134. P. Komulainen, **A. Tölli**, M. Latva-aho and M. Juntti, “Downlink Assisted Uplink Zero-Forcing for TDD Multiuser MIMO Systems”, WCNC’09, Budapest, Hungary, April 2009
135. **A. Tölli**, H. Pennanen and P. Komulainen, “SINR Balancing with Coordinated Multi-cell Transmission”, WCNC’09, Budapest, Hungary, April 2009
136. M. Bennis, J. L. Ambel and **A. Tölli**, “Non-Cooperative Operators in a Game-Theoretic Framework”, PIMRC 2008, Cannes, France, September 2008
137. M. Kangas, **A. Tölli** & M. Juntti, “Performance Evaluation for Multi-user MIMO Uplink with Linear and Non-linear Processing”, ICT MobileSummit 2008, Stockholm, Sweden, June 2008
138. M. Codreanu, **A. Tölli**, M. Juntti and M. Latva-aho, “Uplink-Downlink SINR Duality via Lagrange Duality”, WCNC 2008, Las Vegas, USA, April 2008
139. **A. Tölli**, M. Codreanu, and M. Juntti, “Linear Multiuser MIMO Transmission with Quality of Service and Per Antenna Power Constraints”, GlobeCom 2007, Washington, DC, USA, November 2007
140. **A. Tölli**, M. Codreanu, and M. Juntti, “Minimum SINR Maximization for Multiuser MIMO Downlink with Per BS Power Constraints”, WCNC’2007, Hong Kong, March 2007
141. M. Codreanu, **A. Tölli**, M. Juntti and M. Latva-aho, “MIMO Downlink Weighted Sum Rate Maximization with Power Constraints per Antenna Groups”, VTC spring 2007, Dublin, Ireland, April 2007
142. J. Leinonen, **A. Tölli** and M. Juntti, “Performance Evaluation of Spatial Mode Adaptation and HARQ in Cellular Downlink Systems”, VTC spring 2007, Dublin, Ireland, April 2007
143. **A. Tölli**, M. Codreanu, and M. Juntti, “Linear Cooperative Multiuser MIMO Transceiver Design with Per BS Power Constraints”, ICC’2007, Glasgow, Scotland, June 2007
144. M. Codreanu, **A. Tölli**, M. Juntti and M. Latva-aho, “Low Complexity Algorithm for Joint Design of Tx-Rx Beamformers in MIMO Broadcast Channel”, ICC’2007, Glasgow, Scotland, June 2007
145. **A. Tölli**, M. Codreanu & M. Juntti, “Adaptive MIMO-OFDM Cellular System with Soft Handover between Distributed Base Station Antennas”, GlobeCom’06, San Francisco, USA, November 2006
146. **A. Tölli**, M. Codreanu & M. Juntti, “Soft Handover in Adaptive MIMO-OFDM Cellular System with Cooperative Processing”, PIMRC2006, Helsinki, Finland, September 2006
147. M. Codreanu, **A. Tölli**, M. Juntti and M. Latva-aho, “Weighted Sum MSE Minimization for MIMO Broadcast Channel”, PIMRC 2006, Helsinki, Finland, September 2006
148. G. Middleton, K. Hooli, **A. Tölli**, J. Lilleberg, “Inter-Operator Spectrum Sharing in a Broadband Cellular Network”, ISSSTA’2006, Manaus, Brazil, August, 2006
149. M. Mustonen, K. Hooli, J. Ylitalo and **A. Tölli**, “Application of Intra-RAN Flexible Spectrum Use to Networks with Multi-Rate Services”, PIMRC 2006, Helsinki, Finland, September 2006

150. M. Mustonen, K. Hooli, J. Ylitalo & **A. Tölli** “Application of intra-RAN flexible spectrum use to networks with multi-rate services”. In: Proc. 15th IST Mobile & Wireless Communications Summit, Myconos, Greece, June 4 – 8, 2006, 5 p.
151. **A. Tölli**, & M. Juntti, “Efficient User, Bit and Power Allocation for Adaptive Multiuser MIMO-OFDM with Low Signalling Overhead”, ICC2006, Istanbul, Turkey, June 2006
152. **A. Tölli** & M. Juntti, “Scheduling for Multiuser MIMO Downlink with Linear Processing”, PIMRC’05, Berlin, Germany, September 2005
153. **A. Tölli** & M. Juntti, “System Level Evaluation of Space-Time Turbo Coded MIMO-OFDM for Wide Area Communications”, IST Summit 2005, Dresden, Germany, June 2005
154. **A. Tölli**, M. Codreanu & M. Juntti, “System Level Impact of Non-reciprocal Interference in Adaptive MIMO-OFDM Cellular Systems”, IST Summit 2005, Dresden, Germany, June 2005
155. **A. Tölli**, M. Codreanu & M. Juntti, “Suppression of Non-reciprocal Interference in Adaptive MIMO-OFDM Cellular Systems”, IEEE Vehicular Technology Conference, Stockholm, Sweden, May 2005.
156. S. Thilakawardana, R. Tafazolli, S. Pfletschinger, K. Hooli, **A. Tölli** & A. Tierno, “Efficient spectrum management techniques for future mobile systems”, E2R workshop, Barcelona, September, 2004
157. **A. Tölli** & M. Codreanu, “Compensation of Interference Non-reciprocity in Adaptive TDD MIMO-OFDM Systems”, PIMRC’04, Barcelona, Spain, September, 2004
158. **A. Tölli** and M. Codreanu, “A Closed-loop Method for Interference Non-reciprocity Compensation in Adaptive TDD MIMO-OFDM Systems” Mobile Venue, Radio Network Management Conf., Athens, Greece, May. 2004
159. **A. Tölli**, I. Barbancho, J. Gomez & P. Hakalin, “Intra-System Load Balancing between Adjacent GSM Cells”, VTC2003 spring, Jeju Island, Korea, 2003
160. **A. Tölli** & P. Hakalin, “Adaptive Load Balancing between Multiple Cell Layers”, VTC2002 fall, Vancouver, Canada, 2002
161. J.G. Wangüemert Pérez, **A. Tölli** & P. Hakalin, “Assessment of a New Optimised Event Based Reporting Method and Comparison with Other Measurement Reporting Methods Proposed by the Standard 3GPP TS 25.423”, IAESTED Conference on Communication Systems and Networks, CSN 2002, Benalmadena, Spain, 2002
162. **A. Tölli**, P. Hakalin & H. Holma, “Performance Evaluation of Common Radio Resource Management (CRRM)”, ICC2002, NY, USA, 2002
163. H. Holma & **A. Tölli** “Simulated and Measured Performance of 4-Branch Uplink Reception in WCDMA”, VTC2001 spring, Rhodes, Greece, 2001
164. **A. Tölli** & H. Holma, “Comparison of WCDMA Uplink Antenna Solutions with 4 Receiver Branches”, CDMA International Conference (CIC), Seoul, Korea, October 2000.

CHAPTERS AND CONTRIBUTIONS IN BOOKS

165. **A. Tölli**, L. Thiele, S. Suyama, G. Fodor, N. Rajatheva, E. Carvalho, W. Zirwas, and J. H. Sorensen, “Chapter 8: Massive multiple-input multiple-output (MIMO) systems”. In: “5G mobile and wireless communications technology”, A. Osseiran, J. F. Monserrat, P. Marsch, Eds., Cambridge university press, 2016

166. **A. Tölli**, P. Komulainen, F. Boccardi, M. Bengtsson and A. Osseiran, "Chapter 5 - Multiuser MIMO Systems". In: "Mobile and wireless communications for IMT-Advanced and beyond", A. Osseiran, J. F. Monserrat, W. Mohr, Eds., Wiley, 2011.
167. M. Boldi, M. Olsson, **A. Tölli**, E. Hardouin, F. Boccardi, T. Svensson, L. Thiele and V. Jungnickel, "Chapter 6 – Coordinated MultiPoint (CoMP) Systems". In: "Mobile and wireless communications for IMT-Advanced and beyond", A. Osseiran, J. F. Monserrat, W. Mohr, Eds., Wiley, 2011.
168. J. Melero, A. Toskala, P. Hakalin and **A. Tölli**, "IMT-2000 3G Radio Access Technologies". In: "GSM, GPRS and EDGE Performance – Evolution towards 3G/UMTS", T. Halonen, J. Romero & J. Melero, Eds., Wiley, 2002.

ACADEMIC THESES

169. **A. Tölli**, "Resource Management in Cooperative MIMO-OFDM Cellular Systems". Doctoral thesis, University of Oulu, Department of Electrical Engineering, Acta Universitatis Ouluensis C296, April 2008.
170. **A. Tölli**, "Comparison of Different Uplink Antenna Configurations in WCDMA Base Stations". Master's Thesis [Diplomityö], University of Oulu, Department of Electrical Engineering, March 2000.

NATIONAL MAGAZINE ARTICLES

171. Iinatti J, Kansanen K, Celentano U, Codreanu M, Hooli K, Tapio V, **Tölli A** & Ylitalo J. Tulevat radioverkot testaukseen. Prosessori, Elektroniikan suunnittelu – erikoisnumero, Nov 2006; 11/2006: 57 - 58.

NATIONAL CONFERENCE PAPERS

172. M. Alatossava, **A. Tölli** & J. Ylitalo, "Performance evaluation of multi-antenna communications with adaptive modulation in cellular environments" - Proceedings of the 2005 Finnish Signal Processing Symposium, Finsig05, August 25, 2005, Kuopio, Finland.
173. M. Kangas, **A. Tölli** & M. Juntti, "Radio resource allocation for uplink MIMO communications" - FINSIG'07, Finnish Signal Processing Symposium 2007, Aug 30, 2007, Oulu, Finland, 2007, 6 p

PATENTS

174. J. Kaleva, **A. Tölli**, and M. Juntti, "Transmit precoder signaling techniques for TDD systems," Patent pending, 2015E01498 FI, Jan., 2016
175. **A. Tölli**, E. Tirola & K. Pajukoski, "Bidirectional Signalling for Dynamic TDD Systems", Patent pending, 2014P02165WO, 2/2015
176. G. Venkatraman, T. Hänninen, **A. Tölli** & M. Juntti, "User Selection In Communications", patent pending, WO2013EP59126 20130502 , 5/2013
177. **A. Tölli**, P. Komulainen, J. Karjalainen, H. Pennanen "Interference Avoidance in Mobile Communication Network Employing Distributed Antenna System", patent, No. PCT/EP2009/053239, US8620340 B2, 03/2009
178. M. Codreanu, **A. Tölli**, M. Juntti & M. Latva-aho, "Communication Method and System", patent, WO/2008/074925, 12/2006

179. M. Codreanu, **A. Tölli**, M. Juntti & M. Latva-aho, “Data Transmission Parameter Optimization in MIMO Communications System”, patent, WO/2007/107632 (EP 2007712623, US7627347 B2), 05/2006
180. **A. Tölli** & M. Codreanu, “Data Transmission Method, Communication System, Base Station and Transceiver”, Patent pending, WO/2005/081419 (EP 2005708191), 02/2004
181. **A. Tölli**, J. Navarro Ortiz & H. Montes Linares, “A Traffic Management Method That Divides Time Slots Into Sub-Blocks for Real Time and Non-Real Time Traffic”. Patent, WO2004/102899 (EP2004732334, US7342911 B2), 05/2003
182. K. Johansson, M. Kristensson, U. Schwarz & **A. Tölli**, “Method and system for exchanging the capacity reports in a radio access network”. Patent pending, EP1475980/US20040219912, 04/2003
183. **A. Tölli**, “Traffic management in radio system”. Patent, WO2004/043104 (US10534131), 11/2002
184. **A. Tölli**, U. Schwarz, P. Hakalin & H. Hirvonen, “Measurements in Communication Systems”. Patent, WO/2004/025983 (EP 2002758497, US8005482 B2), 09/2002
185. U. Schwarz, P. Hakalin & **A. Tölli**, “Radio Resource Control Method in Mobile Communication System and Mobile Communication System”. Patent, WO/2004/040935 (EP2002770010), 10/2002
186. J. G. Wangüemert Pérez, **A. Tölli**, P. Hakalin & J. A. Gomez Salvador, “Event Based Reporting Method”. Patent pending, WO/2003/098893 (EP 2003730240), 05/2002
187. G. Ramos, M. Salmenkaita, F. Longoni, F. D'argence, T. Halonen, J. Melero, P. Hakalin, **A. Tölli**, J. A. Cortes, A. Kangas & H. Holma, “Radio Resource Management”, Patent, WO/2002/32179 (EP 2001983742, US 10398739) , 10/2001
188. G. Ramos, M. Salmenkaita, F. Longoni, F. D'argence, T. Halonen, J. Melero, P. Hakalin, **A. Tölli**, J. A. Cortes, A. Kangas & H. Holma, “Channel Allocation for Communication System”, Patent, WO/2002/032173 (EP 2001986835, US 10398716), 10/2001