



Enhanced Multicarrier Techniques for Professional Ad-Hoc and Cell-Based Communications

(EMPhAtiC)

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Plan for the Use and Dissemination of Foreground, Issue 2

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Abstract:

This deliverable presents the dissemination actions taken by the EMPhAtiC project during the first half of the project duration, and proposes identified opportunities for disseminating its outcomes during the second half of the project, including journals, conferences, workshops and standardization and regulation contributions. A revised exploitation plan for the project participants is also presented.

Keywords: Dissemination, Conferences, Workshops, Journals.

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3.0	31.12.2013	Xavier Mestre (CTTC)	Corrections by Martin Haardt (ITU), Didier Le Ruyet (CNAM), David Gregoratti (CTTC) and Eleftherios Kofidis (CTI) introduced.

Executive Summary

The plan for the use and dissemination of foreground is one of the compulsory reports that FP7 projects are required to present to the Commission. It summarises the consortium's strategy and concrete actions to protect, disseminate and exploit the foreground generated by a project. This second issue of the plan presents the dissemination actions carried out by the project during the first half of the project, and identifies opportunities for disseminating the outcomes during the second half of the project, including journals, conferences, workshops and standardization and regulation contributions, among others. The objective is to help participants in order to establish a basis for the dissemination and use of foreground during the second half of the project. A revised exploitation plan for all the project participants is also provided.

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1. Introduction

Dissemination is a key objective of the EMPhAtiC project, mainly because it promotes the concepts and innovative ideas developed within the project among the research community. The project contains several tasks with high scientific value, and it is in the interest of academic partners to publish these results in the open literature. Dissemination activities are scheduled to run for the whole duration of the project.

EMPhAtiC adopts multiple ways to spread out the knowledge generated by the project. One such way is through internal dissemination (i.e. actions aimed at ensuring good spreading of documentation and know-how among the project partners). Another way is through external dissemination, including conference and journal papers, patents, presentations, white papers, organized workshops, etc. This deliverable will only concentrate on this second type of dissemination activities, i.e. those that are conducted in order to gain external visibility and awareness of the results of the project. More specifically, this public report describes the external dissemination activities carried out by the EMPhAtiC project during the first half of the project execution (Section 2). Next, the most important opportunities that are identified for the second half of the project are presented, together with the planned dissemination activities for that period (Section 3).

A brief description of the plans for standardization activities is also provided in this deliverable (Section 4), even though we point out that these activities will be more extensively described in deliverables D10.2.1 “Standardization & Regulatory plan, issue 1”, published in [3], and also D10.2.2 “Standardization & Regulatory plan, issue 2”, to be released in the near future. Finally, a brief update of the partners exploitation plans is also introduced (Section 5). The objective is to provide a renewed vision of the exploitation opportunities in the light of the results and prospects generated during the first half of the project execution.

2. Dissemination activities during the first half of the project

In this section, we describe the main dissemination actions that have been carried out during the first half of the project. This includes the publication of multiple conference and journal papers, the organization of the first project workshop or the dissemination through the EMPhAtiC webpage. We begin by summarizing the impact of the project so far in terms of scientific publications. These are probably the most important dissemination results, since they generate long-term impact in terms of new discoveries and perspectives.

2.1 Conference papers

During the first half of the project, a total of 34 papers have been published or submitted to peer-reviewed conferences. Among those, 23 have now been published, while 11 are still undergoing the review process and are expected to be published in the following months. Below is the complete list of the conference papers published by the project so far.

Conference papers published so far:

1. Dmitry Petrov, Tobias Hidalgo Stiz, Pavel Gonchukov, {WP2, 9} "Link to System Mapping for FBMC Based Systems in SISO case," Proceedings of the IEEE ISWCS 2013, Ilmenau, Germany, August 2013.
2. A. Loulou, S. Afrasiabi, M. Renfors, {WP2, WP3} "Enhanced OFDM techniques for fragmented spectrum use," Future Networks and Mobile Summit 2013 (Lisbon, Portugal).
3. M. Renfors, J. Yli-Kaakinen, {WP3} "Timing Offset Compensation in Fast-Convolution Filter Bank Based Waveform Processing", presented at the EMPhAtiC Workshop, Proceedings of the ISWCS 2013 (Ilmenau, Germany), Aug. 2013.
4. Jérôme Louveaux, André Bourdoux, François Horlin, {WP6} "Low feedback downlink MIMO channel estimation for distributed FBMC systems using SNR measurements", presented at the EMPhAtiC Workshop, Proceedings of the ISWCS 2013, August 2013, Ilmenau.
5. L. G. Baltar, A. Mezghani, J. A. Nossek, WP3 "EM based Per-Subcarrier ML Channel Estimation for Filter Bank Multicarrier Systems", presented at the EMPhAtiC Workshop, Proceedings of the ISWCS 2013, August 2013, Ilmenau.
6. C. Mavrokefalidis, E. Kofidis, A. Rontogiannis, and S. Theodoridis {WP6}, "Optimal training design for channel estimation in OFDM/OQAM cooperative systems," presented at IEEE SPAWC 2013, Darmstadt, Germany, June 2013.
7. C. Mavrokefalidis, E. Kofidis, A. Rontogiannis, and S. Theodoridis {WP6}, "Preamble design for channel estimation in OFDM/OQAM cooperative systems," presented at the EMPhAtiC Workshop, Proceedings of the ISWCS 2013 (Ilmenau, Germany), Aug. 2013.
8. Yao Cheng and Martin Haardt, "Widely Linear Processing in MIMO FBMC/OQAM Systems," Proceedings of the ISWCS 2013, Ilmenau, Germany, August 2013.
9. Jianshu Zhang and Martin Haardt, "Widely Linear Signal Processing for Two-Way Relaying with MIMO Amplify and Forward Relays," Proceedings of the ISWCS 2013, Ilmenau, Germany, August 2013.
10. Jianshu Zhang, Sergiy A. Vorobyov, Arash Khabbazibasmenj, and Martin Haardt, "Sum rate maximization in multi-operator two-way relay networks with a MIMO AF relay via POTDC," presented at EUSIPCO 2013, Marrakech, Morocco, September 2013 .
11. Sladjana Josilo, Milos Pejovic, Slobodan Nedic, {WP2} "Non-orthogonal FBMC – a pragmatic approach", presented at the EMPhAtiC Workshop, Proceedings of the ISWCS 2013 (Ilmenau, Germany), Aug. 2013.

12. Alexandra Oborina, Christian Ibars, Lorenza Giupponi, Faouzi Bader, "Link Performance Model for System Level Simulations of Filter Bank Multicarrier-Based Systems in PMR Networks", ISWCS 2013, Ilmenau, Germany, August 2013.
13. J. Yli-Kaainen, M. Renfors, {WP2} "Fast-convolution filter bank approach for non-contiguous spectrum use," presented in Future Networks and Mobile Summit 2013 (Lisbon, Portugal).
14. A. Loulou, M. Renfors, "Effective schemes for OFDM sidelobe control in fragmented spectrum use", accepted for publication in IEEE PIMRC 2013 (London, UK), Sept. 2013.
15. M. Newinger, L. G. Baltar, J. A. Nossek, {WP3} "MMSE Training Design for Filter Bank Multicarrier Systems with Per-Subcarrier Channel Estimation", IEEE VTC-Fall, Las Vegas, USA, September 2013.
16. Markku Renfors, Faouzi Bader, Leonardo Baltar, Didier Le Ruyet, Daniel Roviras, Philippe Mege, Martin Haardt, Tobias Hidalgo Stitz, {WP2} "On the Use of Filter Bank Based Multicarrier Modulation for Professional Mobile Radio", proceedings of the IEEE VTC 2013 Spring (Dresden, Germany), July 2013.
17. Marius Caus, Ana I. Pérez Neira, "SDMA for filterbank with Tomlinson Harashima precoding". IEEE International Conference on Communications (ICC). Budapest (Hungary), June 2013.
18. Marius Caus, Ana I. Pérez Neira, "Multi-stream transmission in MIMO-FBMC systems". IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP). Vancouver (Canada), May 2013.
19. Marius Caus, Ana I. Pérez Neira, "Comparison of linear and widely linear processing in MIMO-FBMC systems". International Symposium on Wireless Communication Systems (ISWCS). Ilmenau (Germany), August 2013.
20. R. Zakaria, D. Le Ruyet, "On interference cancellation in Alamouti coding scheme for filter bank based multicarrier systems", ISWCS 2013, Ilmenau, Germany, August 2013.
21. M. Pischella, D. Le Ruyet, Y. Medjahdi, "Sum rate maximization in asynchronous ad hoc networks: comparison of multi-carrier modulations", ISWCS 2013, Ilmenau, Germany, August 2013.
22. S. Sall, H. Shaiek, D. Roviras, Y. Medjahdi, "Analysis of the nonlinear spectral re-growth in FBMC systems for cognitive radio context", ISWCS 2013, Ilmenau, Germany, August 2013.
23. Rostom Zakaria, Didier Le Ruyet, "On interference cancellation in Alamouti coding scheme for filter bank based multicarrier systems" {WP4}, ISWCS 2012, Ilmenau, Germany, August 2012.

Conference papers submitted (under review):

24. Xavier Mestre, David Gregoratti {WP4}, "A parallel processing approach to filterbank multicarrier MIMO transmission under strong frequency selectivity", Submitted to ICASSP 2014.
25. M. Caus, Ana I. Pérez-Neira, Miguel Ángel Lagunas, "Low-complexity soft ML detection in coded-FBMC/OQAM systems", submitted to ICASSP 2014.
26. Hanen Bouhadda, Hmaied Shaiek, Yahia Medjahdi, Daniel Roviras, Rafik Zayani and Ridha Bouallegue, [CNAM-SUP'COM (Tunisia)] {WP3} "Theoretical analysis of BER performance of non-linearly amplified FBMC/OFDM signals", submitted to WCNC'2014, Istanbul, Turkey.
27. Rafik Zayani, Yahia Medjahdi, Hanen Bouhadda, Hmaied Shaiek and Daniel Roviras, [CNAM-SUP'COM (Tunisia)] {WP3} "Adaptive Predistortion techniques for non-linearly amplified FBMC-OQAM signals", submitted to VTC2014- Spring, Seoul, Korea.
28. A. Loulou, M. Renfors, {WP2} "Effective schemes for OFDM sidelobe control in fragmented spectrum use," proceedings of IEEE PIMRC 2013 (London, UK), Sept. 2013.
29. J. Yli-Kaainen, M. Renfors, {WP2} "Optimization of Flexible Filter Banks Based on Fast-Convolution," submitted to ICASSP 2014.

30. M. Newinger, L. G. Baltar, A. Lee Swindlehurst, J. A. Nossek, WP3 “MISO Broadcasting FBMC System for Highly Frequency Selective Channels”, submitted for publication in WSA 2014, Erlangen, Germany, March 2014.
31. E. Kofidis {WP3} “Short preamble-based estimation of highly frequency selective channels in FBMC/OQAM,” submitted to ICASSP-2014.
32. D. Tsolkas, N. Passas, L. Merakos, and A. Salkintzis {WP5}, “A device discovery scheme for proximity services in LTE networks,” submitted to WCNC-2014.
33. Yao Cheng, Peng Li and Martin Haardt, {WP4} “Coordinated beamforming in MIMO FBMC/OQAM systems,” submitted to ICASSP 2014.
34. Yao Cheng, Peng Li and Martin Haardt, {WP6} “FBMC/OQAM for the Asynchronous Multi-User MIMO Uplink,” submitted to WSA 2014.

2.2 Journal Papers

Journal papers typically have a stronger impact in the scientific community due to their completeness and detail. During the first half of the project execution, a total of four (4) papers have been published, whereas five (5) additional ones are still undergoing the review process. Below is a complete list of these papers.

Published and accepted journal papers:

1. Xavier Mestre, Marc Majoral, Stephan Pfletschinger, {WP3} “An Asymptotic Approach to Parallel Equalization of Filter Bank Based Multicarrier”, IEEE Transactions on Signal Processing, May 2013.
2. Mylene Pischella and Didier Le Ruyet, {WP5} "Adaptive resource allocation and decoding strategy for underlay multi-carrier cooperative cognitive radio systems ", accepted to Transactions on Emerging Telecommunications Technologies (ETT), Nov 2013.
3. Màrius Caus, Ana I. Pérez-Neira, {WP4} “Multi-stream transmission for highly frequency selective channels in MIMO-FBMC/OQAM systems”, accepted for publication at IEEE Transactions on Signal Processing, Dec. 2013.
4. Rostom Zakaria, Didier Le Ruyet, {WP4} "Inherent interference reduction in filter bank based multicarrier using QAM modulation", Elsevier Physical Communication, 2013.

Journal papers submitted (under review):

5. M. Renfors, J. Yli-Kaakinen, F. Harris, “Analysis and design of efficient and flexible fast-convolution based multirate filter banks”. Submitted to IEEE Trans. Signal Processing in May 2013.
6. Hanen Bouhadda, Hmaied Shaiek, Daniel Roviras, Rafik Zayani, Yahia Medjahdi, and Ridha Bouallegue, [CNAM-SUP'COM (Tunisia)] {WP3} "Theoretical analysis of BER performance of non-linearly amplified FBMC/OFDM signals", submitted to EURASIP JASP.
7. S. Van Caekenbergh, A. Bourdoux, L. Van der Perre, and J. Louveaux, “Low Complexity Preamble-Based Joint CFO and STO Estimation for OFDM/OQAM Filter Bank Multicarrier”, submitted to the EURASIP Special Issue on Advances in flexible multicarrier waveforms for future wireless communications.
8. Yao Cheng, Peng Li and Martin Haardt, {WP6} “Intrinsic interference mitigating coordinated beamforming for the downlink of FBMC/OQAM based multi-user MIMO systems and coordinated multi-point systems,” submitted to the Special Issue of EURASIP Journal on Advances in Signal Processing on Advances in Flexible Multicarrier Waveforms for Future Wireless Communications.
9. S. Josilo, M. Pejovic, B. Djordjevic, M. Narandzic, S. Nedic {WP2, 10} “Multicarrier Waveforms with I/Q Staggering – Uniform and Non-Uniform FBMC,” submitted for publication in the EURASIP journal on Advances in Signal Processing, special issue on Advances in Flexible Multicarrier Waveforms for Future Wireless Communications.

2.3 Patents

The primary objective of patents is clearly not the direct dissemination of results, but the protection of intellectual property rights. However, patents also contribute to disseminate the outcomes of the project in industrial contexts that may not typically follow scientific developments in scientifically oriented media.

So far, two patents have been submitted by members of the EMPhAtiC Consortium. They are listed below:

1. P. Mège and L. Martinod, {WP4} “2-steps MAP antenna processing”, FR patent filing, Cassidian, February 2013.
2. X. Mestre, S. Pfletchinnger, M. Majoral {WP3}, “Method for Equalizing Filterbank Multicarrier (FBMC) modulations”, EU & USA patent filing, CTTC, March 2013.

2.4 Project Presentations in Other Events

Several additional presentations were made in with the objective of further disseminating the activities of the EMPhAtiC project beyond the strictly scientific audience:

1. C. Bader, “The EMPhAtiC project: overview and objectives” presentation at the EC Radio Access and Spectrum (RAS) cluster meeting on 10th October 2012 (Brussels, Belgium).
2. P. Mège, “EC Radio Access and Spectrum (RAS) cluster meeting on 10th October 2012 (Brussels, Belgium): project overview and objectives”, presentation at RAS Cluster WG1 Meeting on Standardization in Lisbon on 2 July.
3. P. Mège, “EMPhAtiC: Spectrum for Future Wideband Public Safety Networks”, presentation at RAS Cluster Cognitive Radio Workshop on frequency regulation on 19 September and participation to Conference on “Spectrum Management: Perspectives, Challenges and Strategies” hosted by the regulator ANACOM on 20 September, both in Lisbon.
4. P. Mège, “EMPhAtiC project: the filterbank multicarrier approach” presentation at next ETSI RRS meeting on 12 & 13 December in Mainz, Germany.

2.5 White papers

The project is actively contributing to the RAS WG1 white paper on “the European view on High capacity PHY for future radio access and 5G”, coordinated and edited by Carlos Bader (Supélec). This white paper is still in the process of writing.

2.6 Special Issues

During the first half of the project, a special issue has been organized at the EURASIP Journal on Advances in Signal Processing entitled “Advances in flexible multicarrier waveforms for future wireless communications”. Most of the guest editors of this special issue are members of the EMPhAtiC project: Eleftherios Kofidis (CTI), Markku Renfors (TUT), Pierre Siohan (Orange Labs), Fred Harris (San Diego State University), and Carlos Bader (Supélec).

2.7 EMPhAtiC Workshop

One of the strategic dissemination objectives of the project is the organization of a workshop in order to increase public awareness of the project results and provide a forum for discussions involving partners and external participants. During the first year of the project, the first EMPhAtiC workshop was held, with the title “Advanced Multicarrier Waveforms and Mechanisms for Future Ad-Hoc and Cell-Based Systems”. It was organized

during the Tenth International Symposium on Wireless Communication Systems (ISWCS'13). It consisted of 11 accepted contributions from the open call for papers and 3 invited talks by renowned multicarrier systems experts. The audience fluctuated around 50 participants. Further details on this workshop can be found in the EMPhAtiC Deliverable 10.3.1, see further [1].

2.8 Collaboration with other EU projects

Another important way of disseminating the activities and results of the project is through the collaboration with other EU projects. For this reason the EMPhAtiC project joined the Radio Access and Spectrum (RAS) cluster and has been actively participating in its meetings and activities (See sections above for further details). Furthermore, during the first half of the project execution, a number of Liaison Agreements have been signed with other EU projects, namely:

- Liaison Agreement with ICT-ACROPOLIS (<http://www.ict-acropolis.eu/>). This is a Network of Excellence on advanced coexistence technologies for radio optimisation in licensed and unlicensed spectrum. The objective is to co-operate as appropriate in assisting each other with dissemination of the respective results of research, standardization and regulatory initiatives in the field of cognitive radio, spectrum sharing and related technologies.
- Liaison Agreement with ICT-CRS-i (<http://www.ict-crsi.eu/>). This is a Coordination Action whose main objective is to stimulate, facilitate and ease cooperation and exchange between current as well as future FP7 research projects on Cognitive Radio systems and ICT standard organizations. More specifically, CRS-i offers to EMPhAtiC a consultancy service on standardization to FP7 projects addressing Cognitive Radio, Dynamic Spectrum Access and Coexistence issues. Furthermore, CRS-i seeks to extend standardization activities of the ongoing FP7 projects beyond the projects' lifetime and reinforce the collaboration of FP7 projects with cognitive radio stakeholders.

2.9 The EMPhAtiC portal

The EMPhAtiC portal (www.ict-emphatic.eu) represents one of the main means for dissemination of the project activities toward both specialized and non-technical readers. CTTC was in charge of designing and setting up the portal as one of the first tasks in the project. CTTC is also in charge of hosting the portal, registering the domain and carrying out its technical maintenance. The content of the webpage is periodically updated, including new publications and EC approved deliverables, as well as new information about organized workshops and events. A screen shot of the homepage of the portal is shown in Figure 1-1 below.

ICT-EMPhAtiC Home Partners Objectives Work Packages Deliverables Dissemination Links

EMPhAtiC Enhanced Multicarrier Techniques for Professional Ad-hoc and Cell-Based Communications

What's New
The deliverables of the first year of the project are now available here.

EMPhAtiC project

- > Home
- > Partners
- > Objectives
- > Work Packages
- > Deliverables
- > Dissemination
- > Links
- > Private
- > Contacts
- > News

Welcome to the Enhanced Multicarrier Techniques for Professional Ad-Hoc and Cell-Based Communications' **EMPhAtiC** - project website.

The goal of **EMPhAtiC** is to develop, evaluate and demonstrate the capability of enhanced multicarrier techniques to make better use of the existing radio frequency bands in providing broadband data services in coexistence with narrowband legacy services. The project will address the Professional Mobile Radio (PMR) application, and in particular the evolution of the Public Protection & Disaster Relief (PPDR) service currently using TETRA or other legacy systems for voice and low-speed data services. Both cell-based and ad-hoc networking solutions are needed for PPDR and will be developed.

Our main emphasis is on filterbank based multicarrier (FB-MC) and single-carrier (FB-SC) waveforms for utilizing effectively the available fragmented spectrum in such heterogeneous environments. The core idea is to develop a multi-mode radio platform, based on variable filter-bank processing, which is able to perform modulation/detection functions simultaneously for different signal formats with adjustable centre frequencies, bandwidths and subchannel spacings. SC-FDMA waveforms are included in the study in order to relax the transmitter power amplifier requirements of mobile terminals. Enhanced OFDM solutions are also considered as alternatives aiming at minimal modifications to the 3GPP LTE standard, which serves as the reference system in the studies. In addition to physical layer functionalities, the project also develops MIMO and MAC-layer techniques, as well as relay networking solutions which are compatible and maximize the benefits of the waveform level solutions.

The **EMPhAtiC** Consortium has a strong expertise in the design of practical TETRA and ETSI BRAN systems and a very good track record in the development of FB-MC and FB-SC data transmission systems. We believe that the design of FB-MC schemes facilitating flexible and efficient multi-access spectrum usage, along with a proof of concept implementation, form the necessary basis for proposing better next generation broadband data solutions for the PMR evolution and other applications, including the 3GPP LTE evolution.

PROJECT ID CARD

Acronym	EMPhAtiC
Title of the Project	Enhanced Multicarrier Techniques for Professional Ad-Hoc and Cell-Based Communications
Proposal Number	318362
Contract Number	318362
Starting date – End date	01/09/2012 – 1/03/2015
Duration (in months)	30
Total Budget	4.147.265.00€

Funded by

European Commission
Information Communication

SEVENTH FRAMEWORK PROGRAMME

Figure 2-1: Main page of the EMPhAtiC web portal.

In Table 2-1 we include a list of the main articles (sections) of the webpage, together with a description and the number of hits that have been recorded (as of 20/12/2013). Clearly, one of the sections that raises the highest interest in the public is the “Deliverables” section, which has recorded a total number of 4950 hits at the time this deliverable is being written. It must be pointed out that the first deliverables were releases just after approval from the European Commission (beginning of December 2013). Therefore, we expect that the impact of this section will significantly increase during the second half of the project execution.

Title of the page	Description	Number of hits
Home	Project presentation and main figures.	14332
Deliverable_list	Provides a list of project deliverables and electronic access to published ones.	4950
Partners_list	Provides a list of participants..	3799
Links	Provides a number of links to other ICT projects, standards and EC webs.	3373
Dissemination	Provides a list of published papers and a link to their electronic copy.	2056
Contacts	Provides the contact information of the project coordinator.	1843
Objectives	Provides a main description of the project objectives and context.	888
Workpackages	Provides a list of workpackages and their relationship.	887
News-article	Provides the latest news about the project (e.g. EMPhAtiC workshops, release of new deliverables, etc.)	459
ISWCS2013	Describes the first EMPhAtiC workshop.	395

Table 2-1: Description of the content of the main webpages of the EMPhAtiC.

3. Dissemination plan for the second half of the project

During the second half of the project, the project will continue and enforce the dissemination strategy that has been followed during the first 15 months. Both targeted dissemination directed to other specific ICT projects with related interests and broad dissemination of information are envisaged. The following subsections provide more details on the strategy and plans that will be followed during the second half of the EMPhAtiC Project.

In summary, we intend to follow the following lines of dissemination actions:

- Publication and presentation of short conference papers and letters.
- Publication of long journal papers summarizing the outcomes of the project.
- Elaboration of white papers summarizing the project view on different topics that are typically relevant to a wider audience.
- Organization of Workshops, lectures, and participation in summer/winter schools jointly with other NoEs from the FP7 projects.
- Organization of Demonstrations to specific events with strategic and/or technological impact.
- Concertation and collaboration with other EU projects.
- Dissemination through the Emphatic webpage.

In the following subsections, we provide more detailed plans that the EMPhAtiC project intends to follow in order to ensure the proper dissemination of the project activities and results through the above channels.

3.1 Conferences, Symposia and Workshops

Participation in conferences is a fundamental way of disseminating the project activities and achievements. Project results and innovations obtained during the second half of the project will be submitted for publication in scientific conferences and workshops that are particularly relevant to the research topics carried out during the project. Table 3-1 provides a non-comprehensive list of conference and workshops that we have considered to be of special relevance for the dissemination of EMPhAtiC results during the second half of the project execution, together with their webpage and deadline for article submission.

Name of the Workshop or Conference	Place	Website	Deadline
European Conference on Networks and Communications (EuCNC 2014)	Bologna, Italy	http://www.eucnc.eu/	21 Feb 2014
International Conference on Cognitive Radio Oriented Wireless Networks (CROWNCOM 2014)	Oulu, Finland	http://crowncom.org/2014/	10 Jan 2014
European Wireless (EW 2014)	Barcelona, Spain	http://www.ew2014.org/	22 Jan 2014
European Signal Processing Conference (EUSIPCO 2014)	Lisbon, Portugal	http://www.eusipco2014.org/	17 Feb 2014

International Symposium on Wireless Communication Systems (ISWCS 2014)	Barcelona, Spain	http://www.iswcs2014.org/	21 Feb 2014
IEEE International Conference on Communications (ICC 2014)	Sydney, Australia	http://www.ieee-icc.org/	15 Dec 2013
IEEE Global Communications Conference (Globecom 2014)	Austin, Texas (USA)	http://www.ieee-globecom.org/2014/	15 Mar 2014
IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC 2014)	Washington (USA)	http://www.ieee-pimrc.org/	15 Apr 2014
IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC 2014)	Toronto (Canada)	http://www.spawc2014.org/	TBP
International Symposium on Communications, Control and Signal Processing	Athens (Greece)	http://isccsp2014.upatras.gr/	15 Dec 2013
IEEE Vehicular Technology Conference (VTC 2014 fall)	Vancouver (Canada)	http://www.ieeevtc.org	TBP
International ICST Conference on Simulation Tools and Techniques (SimuTools 2015)	TBD	http://simutools.org	TBP
IEEE Global Conference on Signal and Information Processing (GSIP 2014)	Atlanta (USA)	http://renyi.ece.iastate.edu/globalsip2014/	16 May 2014
IEEE Sensor Array and Multichannel Signal Processing Workshop (SAM 2014)	A Coruña (Spain)	http://www.gtec.udc.es/sam2014/	10 Feb 2014

Table 3-1: Conferences and Workshops of Interest to EMPhAtiC during the second half of the project execution.

Table 3-2 summarizes the current dissemination plans of the EMPhAtiC partners in conferences and workshops for the second half of the project. For each member of the Consortium, this table includes the number of papers that the partner is planning to submit during the following months at each of the conferences mentioned above. In summary, the Consortium plans to submit around 30 papers to conferences and workshops during the second half of the project. It is worth pointing out that the most important conference contributions of the project are planned to be to EUCNC 2014, EW2014 and ISWCS 2014.

Number of Papers	CTTC	CNAM	TUT	TUM	UCL	CTI	ITU	SINTEF	UNS	CASSIDIAN	TCS	Magister	
EuCNC 2014			1				1	1	1				
CROWNCOM 2014			1			1							
EW 2014	1		1			1	1						
EUSIPCO 2014	1		1	1		1							
ISWCS 2014		2	1	1	1		1				1	1	
PIMRC 2014	1												
SPAWC 2014		2		1									
ISCCSP 2014							1						
VTC 2014 fall												1	
SAM 2014	1												
TOTAL	4	4	5	3	1	3	4	1	1		1	2	29

Table 3-2: Plans for paper submissions to conferences during the following months.

3.2 Journals, magazines and special issues

One of the main targets of dissemination activities in terms of impact is the publication in scientifically reputed journals. As shown in Section 2.2, during the first half of the project execution, a total of 9 papers were submitted or published in prestigious journals. During the second half of the project, we plan to continue this trend as much as possible.

Of particular interest to EMPhAtiC partners is the publication in selected special issues where the focus is specifically related to technical topics developed within the project. In the following months, the following special issues are of particular interest:

- IEEE Journal on Selected Areas in Communications, Cognitive Radio Series, deadline: 5 January 2014, <http://www.isac.ucsd.edu/Calls/CRSeriesCFP4.pdf>. This series aims to serve as a platform for communicating state-of-the-art cognitive radio research, highlighting the research challenges that remain unanswered and further exploring innovative solutions for resolving them.
- IEEE Communications Magazine, Special issue on “5G Networks: End-to-end Architecture and Infrastructure”, deadline: February 1, 2014, <http://www.comsoc.org/files/Publications/Magazines/ci/cfp/cfpcommag1114.html>. This special issue aims to shed light on the fundamental end-to-end technologies for the advanced 5G network infrastructure that will underpin the Future Internet. Particular challenges include the definition of new network architectures, functions and interfaces that can provide hyper connectivity to trillions of devices and feature a 1000-fold E2E capacity increase by 2020.
- EURASIP Journal on Advances in Signal Processing, Special Issue on “Advances in Flexible Multicarrier Waveforms for Future Wireless Communications”, deadline: 25 December 2013, <http://asp.eurasipjournals.com/>. This special issue welcomes contributions to a variety of related signal processing topics as well as application

studies in scenarios including -but not limited to- software defined/cognitive radio (e.g., TVWS), broadband professional mobile radio (PMR), and beyond LTE solutions.

- IEEE Communications Magazine, Special issue on “Disaster Resilience in Communication Networks”, deadline February 1, 2014, <http://www.comsoc.org/files/Publications/Magazines/ci/cfp/cfpcommag1014.html>
The main objective of this special issue is to provide an overview of the state-of-the-art of resilience in communication networks, and to identify the new challenges from emerging network infrastructures in terms of scalability, heterogeneity, and dynamicity. Works addressing resilience issues in the context of new communication technologies, such as software-defined networks, cognitive radio and emerging optical technologies are of particular interest to this special issue.

Apart from those special issues, the EMPhAtiC project will also contribute with regular papers in scientifically reputed journals that are specially relevant for the project activities, such as:

- IEEE Transactions on Signal Processing. This journal constitutes the flagship publication of the IEEE Signal Processing Society. It covers novel theory, algorithms, performance analyses and applications of techniques for the processing, understanding, learning, retrieval, mining, and extraction of information from signals
- Journal of Selected Areas in Communications (J-SAC). Each issue of the IEEE Journal on Selected Areas in Communications (J-SAC) is devoted to a specific technical topic and thus provides to J-SAC readers a collection of up-to-date papers on that topic. The technical topics covered by J-SAC issues span the entire field of communications and networking.
- IEEE Transactions on Wireless Communications. This journal publishes timely, novel and high-quality recent results on Wireless Communications. The journal's goal is rapid dissemination of original, cutting-edge ideas and timely, significant contributions in the theory and applications of wireless communications.
- IEEE Wireless Communications. IEEE Wireless Communications is designed for individuals working in the communications and networking communities. It covers technical and policy issues relating to personalize, location independent communications in all media (and combinations of media), and at all protocol layers. Both wired and wireless communications will be covered as well as computing, the mobility of people, communicating devices, and personal services.
- IEEE Network. The primary purpose of IEEE Network, which is published bimonthly, is to inform readers on topics of interest to the networking community. As such, IEEE Network provides a focus for highlighting and discussing major computer communications issues and developments. The articles are intended to be of a survey or tutorial nature, slanted towards the practical, and comprehensible to the non-specialist.
- EURASIP Journal on Advances in Signal Processing. The aim of the EURASIP Journal on Advances in Signal Processing is to highlight the theoretical and practical aspects of signal processing in new and emerging technologies. The journal is directed as much at the practicing engineer as at the academic researcher.

- IEEE Transactions on Vehicular Technology. IEEE Transactions on Vehicular Technology publishes papers dealing with electrical and electronics technology in vehicles and vehicular systems. Its scope is defined by the areas of Communications, Transportation Systems, and Vehicular Electronics.
- IEEE Communications Magazine. This magazine considered by many to be their most important member benefit, provides timely information on all aspects of communications: monthly feature articles describe technology, systems, services, market trends, development methods, regulatory and policy issues, and significant global events.
- Transactions on Emerging Telecommunications Technologies (ETT). To be the focus in Europe of outstanding contributions from researchers and engineers working in the field of information technology, the ETT journal concentrate papers on the various applications of telecommunications: Communication networks, Communication theory, Information theory, Mobile networks, Optical communications, Cryptography/security, Signal processing, Transmission systems, Wireless communications.
- IEEE Signal Processing Letters. This is a monthly, archival publication designed to provide rapid dissemination of contributions in signal processing at large. Papers published in the Letters can be presented in several workshop organized by the Signal Processing Society.
- EURASIP Journal on Wireless Communications and Networking. The aim of this journal is to to bring together science and applications of wireless communications and networking technologies with emphasis on signal processing techniques and tools.

Table 3-3 includes the planned submissions that each academic institution of the Consortium plans to carry out during the following months. If these predictions are confirmed, around 16 additional journal papers will be submitted during the following months. Of course, this will effectively depend on the potentiality for publication of the final results that are obtained in the project.

Institution	Journal Publication Plans
TUT	IEEE JSAC (1 paper), IEEE Trans. Vehicular Techn. (1 paper), EURASIP Signal Processing (1 paper)
CNAM	IEEE Transaction on Wireless Communications (2 papers)
CTI	EURASIP Journal on Advances in Signal Processing (1 paper), IEEE Communications Magazine (1 paper)
ITU	IEEE JSAC (1 paper)
Magister	EURASIP Journal on Advances in Signal Processing (1 paper)
TUM	IEEE Transactions on Communications (1 paper), IEEE Signal Processing Letters (1 paper)
CTTC	IEEE Transactions on Signal Processing (1 paper), EURASIP Journal on Advances in Signal Processing (1 paper).
UCL	IEEE Trans. Communications (1 paper), IEEE Trans. Wireless Comm. (1 paper)
UNS	IEEE JSAC (1 paper)

Table 3-3: Plans for paper submissions to journal publications in the near future.

3.3 Organization of project workshops

During the second half of the project execution, two different EMPhAtiC workshops are planned to be organized. One of the main recommendations made by the reviewers during the first technical review was the fact that the project workshops should not be closed to EMPhAtiC partners, and should instead cater for a wider audience that includes other projects from the ICT program. For this reason, the project will endeavour to organize the following workshops in collaboration with other ICT projects.

Below we provide a more detailed description of the two workshops that we are planning to organize during the second half of the project:

3.3.1 Joint Absolute-EMPhAtiC workshop at EUCNC 2014.

The ICT Absolute project (<http://www.absolute-project.eu/>) aims to design and validate an innovative holistic network architecture ensuring dependable communication services that allow for a rapid deployment, flexibility, scalability and seamless re-configurability, while providing broadband services and offering resilience, availability and security.

Given the obvious thematic connections between this project and EMPhAtiC, it has recently been proposed to join forces in order to organize a joint Absolute-EMPhAtiC workshop on “Public Safety Communication challenges in 5G”. The objective is to organize this workshop at EUCNC 2014 (Bologna-<http://www.eucnc.eu/>). The deadline for paper submissions: 21 Feb 2014.

The following EMPhAtiC partners have shown interest in the organization of this event: TUT, CTI, ITU, Magister and SINTEF. On the other hand, the following partners have expressed their intention of submitting papers to this workshop: TUT (1 paper), CNAM (2 papers), CTI (1 paper), ITU (1 paper), SINTEF (1 paper), TCS (1 paper).

3.3.2 EMPhAtiC workshop at ISWCS 2014

Following the invitation of the conference organizers, the project also aims to organize a workshop within ISWCS 2014 (Barcelona <http://iswcs2014.org/>). The idea here would be to combine papers from the EMPhAtiC project together with other papers from related ICT projects (such as Absolute, 5GNow, Metis, etc.). Deadline for paper submissions is 18 Apr 2014.

The following EMPhAtiC partners have shown interest in the organization of this event: TUT, CNAM, CTI, ITU, Magister, SINTEF, TUM and UCL. On the other hand, the following partners have expressed their intention of submitting papers to this workshop: TUT (1 paper), CNAM (2 papers), ITU (1 paper), Magister (1 paper), TUM (1 paper), UNS (1 paper).

3.4 Organization of Special Sessions

In an attempt to strengthen the information flow between EMPhAtiC and other ICT related projects like 5GNow and Metis, a special session has been organized within the European Wireless Conference 2014 (<http://ew2014.org/>). This special session, entitled “Filter bank-based techniques in future wireless communications” is being organized by CTI and will bring together papers from the ICT projects EMPhAtiC, Metis and 5GNow.

3.5 Concertation and collaboration with other EU projects

During the second half of the project execution, we aim to continue our collaboration with other ICT projects, either directly or via the RRS cluster activities. In this sense, the project intends to continue its participation in the upcoming RRS cluster and Concertation meetings organized by the European Commission.

Apart from the abovementioned collaboration activities, EMPhAtiC is in the process of signing a new Liaison Agreement with the Absolute project. The objective of this agreement is to facilitate and promote the information flow between the two projects, and the organization of common activities such as the joint workshop at EUCNC 2014 (see above for further details).

On the other hand, the collaboration with the ICT Newcom# network of excellence (<http://www.newcom-project.eu/>) will be reinforced (note that CTTC and UCL are members of this network). In the context of these collaboration activities, TUT will give a lecture on FB-MC techniques at the NEWCOM Spring-School on “Flexible Multicarrier Waveforms for Future Communications Wireless Networks”, Rennes, France, 21-23 May 2014.

3.6 Website

During the second half of the project execution, the EMPhAtiC web site will be continuously reinforced in order to continue to be a useful tool and important source of information for industry and research community, enhancing public awareness on the research activities carried out by the project. Both public deliverables and a list of the papers presented at relevant conferences will be made public at the webpage as the project advances. Furthermore, important information on the different project workshops (call for papers, logistics, etc.) will be made public through the web site.

3.7 Others

Other dissemination activities that will be carried out during the second half of the project execution are listed here:

- TUT will give a tutorial on Filter-bank Multicarrier techniques at the International Conference on Cognitive Radio Oriented Wireless Networks (CROWNCOM 2014). This will be a very good opportunity to disseminate the results of EMPhAtiC.
- A Special Session on “Tensor-based signal processing” will be organized by ITU at SAM 2014. ITU also plans to hold the IEEE Statistical Signal Processing Workshop (SSP 2015). These will be opportunities to disseminate the outcomes of the project.
- Magister is considering the possibility to deliver a course/number of lectures on FBMC at the Jyväskylä University Summer School (https://www.jyu.fi/science/muut_yksikot/summerschool/en/) or in terms of Inforte program (<http://inforte.jyu.fi/>). Results of the EMPhAtiC project will be delivered in these lectures.
- Cassidian will provide a series of contributions to ETSI RRS and ETSI RRS WG4 (including contribution to TR 103 217 “Reconfigurable Radio Systems (RRS); Feasibility study on inter-domain synergies; Synergies between civil security, military and commercial domains”).

4. Plans for contributions to standardization and regulation bodies

The efforts that the EMPhAtiC consortium plans to dedicate to the contribution to standardization and regulation bodies have clearly been detailed in the EMPhAtiC deliverable D10.2.1 [3]. Below we include a summary of the actions that the two main players of the EMPhAtiC consortium mean to take during the following months.

4.1 Cassidian

CASSIDIAN is the first PMR manufacturer in the world with a strong position in Europe with the current PMR technologies: TETRA, TETRAPOL and APCO25. CASSIDIAN is providing Infrastructure equipment (Base Stations and Core Network) and terminals for PMR networks for Public Safety (PPDR: Public protection - Disaster Relief) and for Professionals and Utilities (PUT).

CASSIDIAN is strongly involved in the standardization of PMR systems in ETSI TETRA and in ETSI ERM TGD MR. CASSIDIAN is especially involved in the standardization of future broadband PMR systems in ETSI TETRA WG4. CASSIDIAN is also actively following 3GPP LTE standardization work. CASSIDIAN is also actively participating in frequency regulation bodies (CEPT/ECC WG FM) and especially in the group dealing with PPDR (CEPT/ECC FM49: Frequency Management).

During the second half of the project execution, Cassidian intends to participate in meetings and contribute to ETSI RRS and ETSI RRS WG4, including contributions to TR 103 217 "Reconfigurable Radio Systems (RRS); Feasibility study on inter-domain synergies; Synergies between civil security, military and commercial domains". In addition, if there is opportunity in the frame of 3GPP or of other standardization body, Cassidian envisages to present and propose the FB-MC approach as the basis for 5G Broadband systems.

4.2 Thales Communication & Security

TCS is not strongly involved in the standardization process of PMR systems; however TCS is at least partially following the work of some standardization and regulatory bodies. Actions can be tried inside those Bodies on an opportunistic basis.

TCS has participated to 3GPP SA1 group meetings. TCS is occasionally present to RAN1 meetings. TCS is also present at the plenary meetings of ETSI "Reconfigurable Radio Systems (RRS)" Technical Committee. Concerning lobbying activities, TCS is active in the Wireless Innovation Forum (WInnF) as far as Software Defined Radio (SDR) is concerned. Presentations of the EMPhAtiC in the previous context may be done if required, depending on the availability of the persons going to those meetings.

5. Revised Exploitation Plan

Based on the preliminary results and the experience obtained during the first half of the project execution, the EMPhAtiC partners have revised their plans for the future use of generated foreground as follows:

5.1 CTTC

As a non-profit institution, CTTC does not plan for a direct commercial exploitation of the results obtained within the EMPhAtiC project. However, CTTC intends to take advantage of the knowledge and experience gained within the EMPhAtiC project in future research and technology transfer projects. Of utmost importance for that objective is the development of the EMPhAtiC hardware demonstration that CTTC is carrying out in the project, as well as the patent on FBMC equalization that has recently been filed. CTTC is particularly interested in exploring the possibility of using the EMPhAtiC technology for the physical layer of the new 5G mobile communication standard.

5.2 CNAM

Since the beginning of this project, we can observe an increasing interest in research on advanced waveform for professional radio and more generally for 5G. We expect to publish important papers in this field and file patents jointly with the companies involved in the project (mainly Cassidian, Thales) in order to keep our expertise in this field of research.

5.3 TUM

TUM will intend to exploit the results of the project in parallel and future and research activities, both in academic and industry driven projects. One planned concrete case study is the application of the proposed variable filterbank scheme for efficient spectrum exploitation and spectrum sensing in 2.4 GHz ISM band.

5.4 TUT

TUT is participating in a national project on the application of advanced multicarrier techniques in military communications, in which context also the EMPhAtiC project results are planned to be exploited. The group is actively seeking for new academic and industrial projects in the topic area. Advanced multicarrier techniques are also included in the teaching activities of the TUT group, and several Ph.D. and M.Sc. students are doing their thesis projects in this topic area, also outside the EMPhAtiC project.

5.5 UCL

UCL will continue to use the results and the expertise obtained in the project for its ongoing research in the general topic of FB-MC transmission. This will directly benefit the Ph.D. students that started recently on the topics as well as a few who are expected to start shortly. Interacting with companies interested in the subject also allows for a better understanding of all the constraints and requirements for implementing the considered solutions, which helps tailoring future research and stimulates the creation of future applied projects. Finally, this project is also a perfect environment to create fruitful collaborations with various institutions which can carry on long after the project itself.

5.6 CTI

Two postdoc researchers (on PHY topics) and a PhD student (on MAC and cross layer) have been working in the project. They have given the chance to learn about filtered multicarrier systems, study hot research problems in this area, and develop/enrich their knowledge and experience on LTE and PMR standards (including specs and simulation details). This experience will be extremely useful for the rest of the project, allowing us to build upon previously obtained results and most importantly design methods and setup experiments that are even more realistic and conformed to the standards' recommendations. Recognizing the quality of the obtained experience, CTI plans to use all available means to continue engagement with the researchers after the end of this project, either through other funding programs or regular recruitment procedures.

Building on the previous related experience acquired in the PHYDYAS project, the active involvement of our group in a variety of research activities within EMPhAtiC is forming a solid foundation of knowledge (both theoretical and practical) and prepares young researchers for a fruitful continuation of research in this promising area. These conditions pave the way for the participation of our institution in future research projects that will address related or other issues in future wireless communications. The collaboration with some of the partners of the consortium that has started within the project is expected to continue in the future, further expanding the research horizon for CTI research personnel. Moreover, being also an applied research centre, CTI is committed to connect high impact research with industrial interests and needs. It will therefore investigate the possibility of exploiting the obtained knowledge and results with an industrial partner, either from the consortium or outside.

5.7 ITU

The outcome of the research activities will contribute to the improvement of the broadband PMR systems. In addition, FBMC under investigation will be a potential candidate for the 5G PHY. Moreover, the research results of the EMPhAtiC project will be exploited to graduate Master and PhD students in the Department of Electrical Engineering and Information Technology, Communications Research Laboratory, at ITU. Furthermore, the project results will fuel a continuously on-going revision of the graduate curriculum in communications and signal processing, where we have just started a new international Master's program. The topics of the project are of significant interest to the industry, and it is expected that the project will strengthen collaboration with industrial partners and with research institutes. Finally, the knowledge built up in the project will, together with the knowledge available at ITU, form the basis for the definition of future research projects to be carried out together with other European partners.

5.8 SINTEF

SINTEF is doing contract research for industrial partners. Most of our income is from these activities. The knowledge and experience we gain in the Emphatic project is very useful and will enhance the capabilities of the Communication Systems Group to serve current and future customers.

The FBMC technology, similar to what is developed in Emphatic, is in fact now being implemented in a commercial product for an industrial customer. Due to or participation in

the Emphatic project this can be done much more efficient with less effort and time consumption.

5.9 UNS

Up to the present stage of the project execution, the weaknesses of the curricula customary conducted at the Telecommunications Section of the Faculty of the Technical Sciences, in both the theoretical (algorithmic) and practical (programming) aspects have become apparent, and the initially planned strengthening of the education process towards increased abilities to work on and successfully contribute to the research and development projects of this rang and breadth is very much actualized. To that end, jointly with the chair of Electronics, internal efforts towards practical implementation of the demonstrator paralleling the one planed in the project will be immediately undertaken, to timely create the basis for the formation of the spin-off company planed after completion of the project.

5.10 CASSIDIAN

Cassidian plans to exploit EMPhAtiC project result in the frame of standardization. In a first step to ETSI RRS and ETSI RRS WG4. Cassidian aims also to prepare contributions to 3GPP standardization.

Cassidian's objective is to develop its involvement in Broadband for PMR and PPDR, using EMPhAtiC approach and results to be leveraged in LTE works and in evolution of LTE, especially in the 400 MHz band and also in 700 MHz band.

The objective of Cassidian is to propose, based on EMPhAtiC projects approach and results, a migration path from existing PMR systems, that will last for several years, to enhanced Broadband PMR systems, taking into account the scarce frequency resource.

The objective of Cassidian is to focus on a better usage of frequency spectrum resource, and EMPhAtiC project, with FB-MC approach, as well as with the other technics considered such as advanced antenna technics, is a good basis for reaching this goal for the benefit of the Public Safety users and for the benefit of all the actors in the domain of Public safety.

5.11 TCS

TCS was not extremely active during the first part of the project, because the WPs and in particular the Tasks in which it is involved, started their activity officially only in the last quarter of the first year. So there are no significant results that can update substantially the exploitation plan. However, below we restate our exploitation plan, and make minor adjustments.

The results of the projects would be exploited in various ways in Thales Communications & Security. From a research perspective, the global findings of the project and the simulators developed for clusterized ad-hoc networks will be used as a starting point for future investigations in broadband wireless systems of the next generation, like adaptation of 3GPP LTE-Advanced for high data rate security specific systems such as PMR. Concerning TCS products, these studies could provide inputs for the next generation of TCS professional radios based on top of LTE, like Nexium Wireless, by providing a deeper knowledge of the lower layer operation, and the capability of validating (at least partially) solutions at system level (maximum MAC layer).

The EMPHATIC project will enable (and in fact is already enabling) to build competences on FBMC which seems to be a serious candidate for the 5G cellular networks and for future evolutions of broadband. Today, acquiring knowledge on FBMC seems to be of fundamental importance for being able to make strategic technical choices in the future. For examples, results on realistic frame design of an FBMC PHY layer, as done in the EMPHATIC project, have a practical importance. Having a frame design for FBMC (able to support synchronization and channel estimation) is the first unavoidable step towards the comparison with legacy PHY technologies.

5.12 BITGEAR

Business model Bitgear is practising is mostly based on offering customisation services on top of its existing and proven IP. With this in mind the exploitation approach of project outcomes will primarily be to utilise them to upgrade existing in-house IP, such as COFDM or OFDMA cores. Obviously, the upgrade would be performed with relevant techniques devised during the life-cycle of this project, thus advanced filterbank design or channel estimation could be used. In the same time, with the upgrade of the IP, the participation of Bitgear in a project targeting PMR would allow for extension of business activities from the commercial telecommunications arena, where most of the activities are at the present, to more demanding arenas of professional radios, which would on a longer run generate new business opportunities.

5.13 MAGISTER

For the moment Magister Solutions is finalising the study of link-to-system interface in the case of FBMC PHY. However some further investigations can be made in this direction, in particular how channel estimation and 1 RB resolution will influence the precision of PHY performance model. In a parallel, the work on the preparation of ns-3 system level simulator has been done. Therefore the next step will be adaptation of FBMC link level abstraction model in system level simulator. After this task is fulfilled, Magister will mostly focus on the performance and coexistence studies of FBMC-based/PMR network on the system level.

6. Conclusions

This document summarizes the dissemination activities carried out during the first half of the EMPhAtiC project execution, and presents a dissemination strategy and plan to be followed until the end of the project and beyond.

During the first half of the project, 23 international conference articles have been published and 11 are currently undergoing the review process. Four journal papers have now appeared and five additional ones have been submitted and are being reviewed. Two patents have been filed and project workshop has been organized. On the other hand, several dissemination actions have been conducted in order to disseminate the results of the project among other ICT projects, i.e. through a common white paper, presentations at RAS cluster meetings, etc. The EMPhAtiC webpage has been continuously updated with novel information about the project dissemination results, workshops and approved deliverables.

The dissemination strategy for the second half of the project will follow and reinforce the actions carried out so far. A list of relevant conferences for the EMPhAtiC project has been presented, together with their webpage addresses and deadlines for article submission. Detailed plans indicate that around 30 papers will be submitted to international conferences and workshops by EMPhAtiC partners. On the other hand, a detailed review of the relevant journals and special issues has been provided. Current plans indicate that the project will submit more than ten papers to journal publications. Finally, EMPhAtiC plans to organize two additional project workshops and a special session in collaboration with other ICT projects.

Regarding the project contributions to standardization and regulation bodies, contributions to ETSI RSS and particularly to ETSI RRS WG4 will be targeted. The objective is to provide inputs to the technical report TR 103 217 on “Reconfigurable Radio Systems (RRS); Feasibility study on inter-domain synergies; Synergies between civil security, military and commercial domains”.

Finally, the last part of this document has presented a revised plan for future use of generated foreground based on the preliminary results and experience obtained during the first half of the project execution.

7. References

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Glossary and Definitions

Acronym	Meaning
CTTC	Centre Tecnològic de Telecomunicacions de Catalunya
CTI	Computer Technology Institute
DoW	Description of Work
E2E	End-to-end
EC	European Commission
ETT	Emerging Telecommunications Technologies
EURASIP	European Association on Signal Processing
EUCNC	European Conference on Networks and Communications
FB-MC	Filter-bank Multi-carrier
ISWCS	International Symposium on Wireless Communication Systems
ITU	Ilmenau University of Technology
JSAC	Journal on Selected Areas in Communications
NoE	Network of Excellence
PMR	Professional Mobile Radio
PPDR	Public protection - Disaster Relief
PUT	Professionals and Utilities
RAS	Radio Access and Spectrum
RRS	Reconfigurable Radio Systems
TCS	Thales Communications & Security
TUM	Technical University of Munich
TUT	Tampere University of Technology
UCL	Université Catholique de Louvain
UNS	University of Novi Sad
WG	Working Group
WP	Workpackage