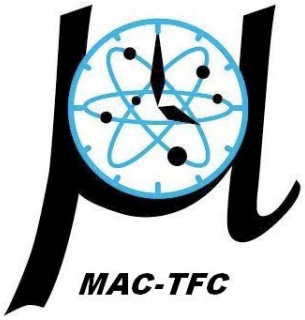

Deliverable Report

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Executive summary:

This deliverable describes the actions of networking and communication performed during the first period of reporting PR1 (from M1 to M12) of MAC-TFC proposal. The main target during this early stage of proposal is the definition and implementing of MAC-TFC website - this is the central task described by D8 (update). Other actions of communication and networking aiming to disseminate the results of proposal are mentioned here.

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Document Editor	C. Gorecki A. Michaud		28/09/09
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Project Coordinator	C. Gorecki		13/10/09

Contributing partners

Group	Name(s)	Role
UFC-P5	C. Gorecki	website
OSA	A. Michaud	dissemination

Table of Content

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1. Introduction

The workpackage concerned by this deliverable is WP8. WP8 is implemented to guarantee the effective dissemination and use of the achievements and to promote the applications of MEMS atomic clock. During the period of first periodic reporting (PR1: from M1 to M12) three sub-workpackages were active:

- WP8.2 Creation of website
- WP8.3 Strategy of publications via conferences, presentations and tutorials
- WP8.4. Dissemination of project results

However, at such an early stage of proposal, the main part of this report will focus on the creation of MAC-TFC website, which is our main tool to disseminate and exploit the results. This work is reported by the update of deliverable D8. This report covers the scientific publication of project results as well as the strategy of dissemination aiming to improve the commercial impacts of the proposal.

2. Strategy of scientific publication and communication materials

The research results of proposal will be published at international conferences, EU-workshops and refereed journals. The consortium members participated recently to the relevant conferences in the field of time-frequency and micro technologies.
In order to reinforce the dissemination, to increase participation in the European Research Area and to establish possible synergies between MAC-TFC and other projects in the Microsystems area, the MAC-TFC consortium will actively participate in EC organized events such as project concertation meetings, consultation meetings, ICT conferences, etc.
Furthermore, the MAC-TFC project results will be disseminated to the European industry through cooperation of the consortium members with manufacturers and wireless telecom companies as well as time-frequency metrology players.

As of the second year of the project a so called "MAC-TFC Advisory Board" (called EMT in Annex 1) will be created.
Beside the academic community which is largely involved in the project, the Advisory Board will additionally involve the Industry community. The main goals are here to:

- Disseminate vulgarized information to Industry Manufacturers and Operators so to identify, evaluate and enable the potential applications such as Telecom wireless, GPS, Time and Frequency and others to be identified.
  The expected feed back is in terms of Specification adjustment, Performance Requirement, Market Size, Market Planning, and Market Access channels.
- Disseminate more targeted technical and marketing information to key technology providers and potential manufacturers for MAC-TFC product. The expected feed back is here in terms of technology advice, manufacturing feasibility and manufacturing cost impact. This input is mandatory to better drive the later Industrialisation and integration phases of the project.

In addition to the MAC-TFC website, the following communication channels are used also for the dissemination of the project:

Brochure and/or flyer
A brochure (e.g. A4 3 folded, double page) with an introduction to the project and contact information (Deliverable D07) is now available on the website of proposal (link: http://www.mac-tfc.eu/dissemination.php).

Conferences and workshops

In parallel with seminars and workshops, participation in different conferences will be important to promote the results of the MAC-TFC project. The consortium will submit papers and articles, acknowledging the project and the EU Commission for the financial support. It will be of great interest for the project to be able to have feedback from external specialists in order to collect suggestions and to create debates.

When the results of MAC-TFC proposal are presented at conferences, or elsewhere, some brief information will be published on the web site and the presentations and other accompanying information will be downloadable from the website.

Journals:

- Electronics Letters
- Optics Express
- IEEE/ASME Journal of Microelectromechanical Systems
- Optics Letters
- IEEE International Conference on Micro Electro Mechanical Systems
- Journal of Micromechanics and Microengineering
- Sensors and Actuators
- Journal of Microlithography, Microfabrication, and Microsystems
- Applied Physics B
- IEEE Transactions on Instrumentation and Measurements
- Technical Physics Letters
- Review of Scientific Instruments
- The European Physical Journal D
- Optics and Lasers in Engineering
- Applied optics
- IEEE Journal of Quantum Electronics
- Physics Review A

Possible conferences to be attended

- MEMS
- Optical MEMS
- Transducers
- Eurosensors
- SPIE Photonics Europe or major optoelectronic conferences

At a later stage that is still to be defined, Industry conferences will be attended and the technology will be presented. The actual list is still to be defined as this is a too early stage. For understanding purpose, such events could very well be:

- EFTF: European Frequency and Time Forum
  The European Frequency and Time Forum (EFTF) is an international conference and exhibition, providing information on recent advances and trends of scientific research and industrial development in the fields of Frequency and Time.

- ITSF: International Telecom Synch Forum

- And the same in the field of GPS community, Defence Industry, Broadcasting Industry, among others. The actual list of such event is to be defined according to the feed back of the "advisory Board".

3. List of dissemination actions

We are in the early stage of dissemination. The following list of MAC-TFC publication and publicity materials are extracted from the extranet of MAC-TFC website (pdf files are accessible from the intranet). This list contains all publications concerned by proposal background as well as the publications presented during the first reporting period:

Journals

1) A. Douahi, L. Nieradko, J. C. Beugnot, J. Dziuban, H. Maillote, S. Guérandel, "Vapour microcell for chip scale atomic frequency standard", Electronics Letter, vol. 43(5), 279-280 (2007).
2) L. Nieradko, C. Gorecki, A. Douahi, V. Giordano, J.-C. Beugnot, "New approach of fabrication and dispensing of micromachined cesium vapour cell", J. of Micro/Nanolithography, MEMS, and MOEMS, vol. 7, 033013 (2008).

Conferences

1) Nieradko, C. Gorecki, V. Giordano, A. Douahi, J. Dziuban, "MEMS−based silicon micro-cell for atomic clock applications", Intl. Conference ICMAT 2007', Proc. of Symposium on MEMS and Devices, 213-216, Singapore, July 2007.
2) A. Douahi, L. Nieradko, J.C. Beugnot, J. Dziuban, H. Maillote, R. Boudot, S. Guérandel, « Développement de micro−cellules à vapeur pour horloge atomique miniature », Actes des Journées Nationales Microondes, JNM 2007, Toulouse, 2007.
3) L. Nieradko, C. Gorecki, V. Giordano, A. Douahi, J. Dziuban, "From the Implementation to the Characterisation and Assembling of Microfabricate", Proc. of Transducers & Eurosensors '07, 45-48, Lyon, June 2007.
4) A. Douahi, L. Nieradko, J.C. Beugnot, J. Dziuban, H. Maillote, R. Boudot, S. Guérandel, "New vapor cell technology for chip scale atomic clock" , EFTF−IFCS 2007, *Proc*. of the EFTF−IFCS, Genève, May 2007.
5) M. Hasegawa, P. Dziuban, L. Nieradko, A. Douahi, C. Gorecki, V. Giordano, "Fabrication of wall-coated Cs vapor cells for a chip-scale atomic clock", *Topical* Meeting on Optical MEMS & Nanophotonics', Proc. of IEEE/LEOS, 162-163, Fribourg, August 2008.
6) C. Gorecki, M. Hasegawa, N. Passilly, R.K. Chutani, P. Dziuban, S. Gailliou, V. Giordano, **invited paper**: "Towards the Realization of the First European MEMS Atomic Clock", Proc. IEEE CFP09MOE-CDR, IEEE/LEOS International Conference on Optical MEMS and Nanophtonics, 47-48, Clearwater, August 2009.
7) R. Michalzik, J.M. Ostermann, A. Al-Samaneh, D. Wahl, F. Rinaldi, P. Debernardi, "Polarization-stable VCSELs for optical sensing and communications", 14th OptoElectronics and Communications Conf.,paper TuC2, Hong Kong, July 2009.
8) L. Mauri, "Micro-sized metal vapour sources for MEMS Atomic Clock", XIX AIV Conference, Senigallia, May 2009.

Book chapters

9) V. Giordano, C. Gorecki, L. Nieradko, M. Hasegawa, P. Dziuban, A. Douahi, "Micro-horloges atomiques à` l'Institut Femto-ST de Besançon", La Micro-Nanoélectronique: Enjeux et Mutations, *CNRS Editions*, December 2008.

MAC-TFC related publications

10) A. DOUAHI, « Contributions au développement d'une microhorloge CPT: Etude des microcellules à vapeur de césium », PhD manuscript, Besançon *2009, Besançon.*
11) He Junje, « Analyse thermique de la cellule de Césium d'une micro horloge atomique », Master manuscript, Besançon 2008.

Publicity material

11) V. Giordano, C. Gorecki, G. Mileti, ”Une horloge atomique MEMS de la taille d’un dé à coudre”, Journal En Direct, vol. 219**,** April 2008.
12) MAC-TFC flyer
13) I. Laszczyk, MAC-TFC logo