MAMMOET - Massive MIMO for Efficient Transmission

Newsletter

November 2014 - Issue 2

Main Project Information

MAMMOET aims to bring MaMi (Massive MIMO) from an initial promising concept to a highly attractive technology for usage in future broadband mobile networks. In order to achieve its overall goal, the project has a number of important scientific and industrial objectives. These includes fundamental, experimental and standardisation elements. The five main objectives are:

- **Elaborate system concepts and approaches**
- **Flexible and effective signal processing**
- **Efficient implementation**
- **Prove overall innovation concepts and enabling hardware (HW)**

In this Issue

Message from the Coordinator

The first project year of the MAMMOET project has nearly passed and was very successfully.
Two deliverables have been submitted and two milestones have been reached. Mid of September all partners met in Lund/Sweden for a technical- and Advisory Board meeting. The technical discussions were productive to progress the overall project and specifically reinforce links between work packages. The main result was to discuss relevant partner contributions and further progress of the project as well as planned dissemination activities in order to better promote MAMMOET. Especially interesting was the visit to the Massive MIMO test-lab which is up to test some MAMMOET results in this lab. Moreover, several partners participated in various conferences and workshops where they represented the project. Such dissemination activities will also continue throughout the winter months and beyond. In March the first review meeting in Brussels/Belgium has been scheduled. For a more detailed overview of upcoming meetings, conferences and other dissemination material, please visit our project website: www.mammoet-project.eu.

Results of the first year - Deliverables

A first set of deliverables created throughout the first MAMMOET project year will be presented at the first EC review meeting:

Deliverable 1.1 "System scenarios, and requirements specifications" (Public)
Diverse and challenging 5G mobile broadband scenarios are considered and prioritized (leveraging on relevant available information), as well for outdoor as for indoor. These include for example an open exhibition and massive connectivity with crowded buildings. For these scenarios, the main characteristics relevant for MaMi are derived. In parallel with the application top-down considerations, from the technology up fundamental limits, practical trade-offs and specifications are reported on to the EC.

Deliverable 3.1 "First assessment of baseband processing requirements for MaMi systems" (Public)
The assessment of the baseband processing requirements for MaMi systems logically starts with an algorithm overview. Many of these algorithms are also found in traditional MIMO systems, with the essential difference that a much larger number of transceiver chains have to be processed in parallel. While this expands the processing complexity, properties of MaMi also allows many of the algorithms to be linear rather than non-linear, which helps to balance the massive increase of transceiver chains.
We report on the first steps towards finding algorithms that ensure high communication performance, yet can be efficiently mapped onto appropriate hardware and thereby make MaMi a proven alternative for future communications standards.

Deliverable 5.1 "Project quality plan and internal IT communication infrastructure including project website" (Public)

In addition the "1st Periodic Report according to EC regulations of the model contract" is currently in preparation and will be submitted to the EC.

Start Date: 1 January 2014
End Date: 31 December 2016
Duration: 36 months
Project Reference: 619086
Project Costs: € 4.384.904
Project Funding: € 3.047.000

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Consortium: 8 partners (4 countries)
Project Coordinator: Dr. Klaus-Michael Koch
coordination@mammoet-project.eu
Technical Leader: Dr. Franz Dielacher
franz.dielacher@infineon.com
Scientific Leader: Dr. Liesbet van der Perre
vdperre@imec.be
Project Website: www.mammoet-project.eu

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Results of first year - Milestones

Within the first project period, two main Milestones have been reached:

- **Successful project start**
  - Successful Kick-Off meeting
  - All legal requirements ready
  - Internal communication infrastructure set up
- **Specification & system concepts**
  - System scenarios and requirements specifications (D1.1)
  - Algorithms & architecture exploration (D2.1)

Outlook for the second MAMMOET project year

We made good progress during our first year of MAMMOET activities, which provide a solid basis for the upcoming one. Our main upcoming objective is the development of the most promising Tx architectures and the analysis of the data of the channel measurements. It is planned to finalize the initial assessment of base-band processing requirements for massive MIMO and the exploration of requirements on flexibility in order to determine the most suited hardware platform.

The "**2nd Periodic report according to EC regulations of the model contract**" will contain a description of our work during year 2, which will result in the following list of public deliverables:

Deliverable 1.2 – "MaMi Channel Characteristics: measurement results"

Deliverable 2.4 – "Analysis of non-reciprocity impact and possible solutions"

Deliverable 2.5 – "Description of MaMi digital modulation and architectures for efficient MaMi transmission"

Deliverable 3.2 – "Distributed and centralized baseband processing algorithms, architectures, and platforms"

Deliverable 5.5 – "Updated plan and initial report on dissemination, standardization and exploitation"

MAMMOET partners with Lund's antenna array

Upcoming and past events

Upcoming Meetings & Events:

- **IEEE International Workshop on Computer Aided Modeling and Design of Communication Links and Networks (CAMAD)**
  1st December 2014, Athens/Greece
- **2nd IEEE Global Conference on Signal and Information Processing**
  3rd - 5th December 2014, Atlanta/USA
- **IEEE Global Communication Conference (Globecom) 2014**
  8th - 12th December 2014, Austin/USA
  8th December 2014, Workshop: Massive MIMO: From theory to practice (MassMIMO)
- **International Solid-State Circuits Conference**
  24th February 2015, San Francisco/USA
- **1st MAMMOET review meeting**
  17th March 2015, Brussels/Belgium
- **MAMMOET technical meeting**
  18th March 2015, Leuven/Belgium

MAMMOET present at past events:

- **IMEC Technology Forum Brussels 2014 (IFT)**
  4th - 5th June 2014, Brussels/Belgium
- **NetWorld2020 Experts Workshop**
  23th June 2014, Bologna/Italy
- **European Conference on Networks and Communications**
  23th - 26th June 2014, Bologna/Italy
- **NIWeek 2014**
  5th August 2014, Austin/USA
- **3GPP meeting**
  20th August 2014, Dresden/Germany
- **MAMMOET technical meeting and Advisory Board meeting**
  9th - 10th September 2014, Lund/Sweden
- **2014 IEEE Workshop on Signal Processing Systems (SiPS)**
  20th October 2014, Belfast/United Kingdom

Contact:

MAMMOET Project Coordination Team
Dr. Klaus-Michael Koch
Technikon Forschungs – und Planungsgesellschaft mbH
Burgplatz 3a, A-9500 Villach
Tel.: +43 4242 23355 - 71
Fax.: +43 4242 23355 - 77
E-Mail: coordination@mammoet-project.eu
Website: www.mammoet-project.eu