



## EASY-C shows leading results on LTE-Advanced techniques

Dresden / Germany, 2010-04-16. The German research project EASY-C, co-funded by the German Ministry of Research and Education (BMBF), shows latest project results at a public workshop in Dresden, Germany, on April 16th 2010. The project has focused on the development and implementation of fundamentally new approaches to boost the capacity of next generation mobile networks. Among experts, these approaches are denoted as Coordinated Multi-Point (CoMP), and they are candidates for so-called LTE-Advanced, which is the next innovation step after the recently finalized standard Long-Term Evolution (LTE) Release 8. EASY-C has not only provided the principal proof-of-concept of these approaches in the world's largest research test beds in Dresden and Berlin, but also gained significant experience in the implementation and application of LTE-Advanced concepts, revealing inherent challenges and performance-complexity trade-offs. "The project has provided the German mobile communications industry with a large head-start concerning LTE-Advanced and a stronger impact on standardization", says project coordinator Prof. Dr. Gerhard Fettweis from the Vodafone Chair Mobile Communications Systems at the Technische Universität Dresden. Among other demonstrations, the participants will see a live field demonstration of a particular CoMP concept, namely the world's first coherent transmission from three base stations to three mobile terminals.

While German mobile network operators are currently bidding for 360 MHz of new spectrum to offer their customers higher data rates using the LTE Release 8 standard, the EASY-C researchers are already focusing on key technologies for the next innovation steps towards LTE-Advanced. These innovations are related to reducing the interference between adjacent cells, which causes the main performance limitation of today's mobile networks, especially in urban areas where base stations are deployed densely. One solution is to let multiple base stations jointly process the signals of the terminals served in their cells. In this way, terminals can share the same time and frequency resources in adjacent cells. "These CoMP systems promise much higher data rates in mobile networks and, more importantly, better availability of mobile broadband connectivity regardless of the user's location. Further research will be directed to reduce the costs of these promising approaches", states Prof. Dr. Dr. Holger Boche, scientific director of the Fraunhofer Heinrich-Hertz-Institute in Berlin. Both aspects are needed to address the ever increasing demand for inexpensive mobile data traffic fed by novel mobile applications and Web 2.0.

EASY-C is a collaborative research project co-funded by the German Federal Ministry for Education and Research (BMBF). The project is led jointly by Deutsche Telekom and Vodafone and coordinated by the Vodafone Chair Mobile Communications Systems at Technische Universität Dresden and the Fraunhofer Heinrich-Hertz-Institute in Berlin. The project consortium further includes 12 industrial partners, semiconductor manufacturers, equipment suppliers, hard- and software tool providers and regulators.

### Further information for the technical press

The first class of new transmission techniques investigated within EASY-C is commonly referred to as Coordinated Multi-Point (CoMP). By using CoMP, the co-channel interference from other cells can be alleviated or even exploited. Multiple base stations can jointly transmit or receive the data of users served in their cells. By synchronizing the whole network, the result of such coherent coordination is that the desired signals interfere constructively and the interference destructively. As a second research topic, additional relay nodes are introduced to distribute the power more evenly in the cell. Relays enable better coverage and enhance the availability of

broadband capacity where it is needed, e.g. indoors and in rural areas. Finally, innovative antenna concepts and self-organizing networks are developed by the project partners to reduce the cost per bit in next generation mobile networks.

**The key technological achievements presented at the workshop are:**

- The experimental proof that various CoMP concepts so far only investigated in theory do indeed work in practice.
- The identification of major challenges and proposal of solutions related to these concepts, such as synchronization, channel estimation, feedback and efficient backhauling.
- Development of CoMP concepts that can be used with minimal changes to the current LTE standard, such as
  - Remote radio head concepts
  - Interference aware link adaptation, scheduling and beamforming
  - Single-cell multi-user detection
- Comprehensive evaluation of the potential gains of different CoMP concepts w.r.t. the required effort, both through simulations and practical field trials.

After the strong resonance of an initial EASY-C public workshop in December 2008, the EASY-C project partners once more present their latest research findings and a multitude of live demonstrations. The event is co-located with a meeting of the LTE/SAE trial initiative (LSTI) taking place before the workshop. Around 100 international mobile communications experts are expected to attend the workshop. They will have the chance to observe the world's first live outdoor demonstrations of CoMP transmission and detection techniques and to discuss with researchers several field measurement results. In a panel discussion, the project partners will answer questions on the project results, and on the way forward regarding LTE-Advanced.

**Please find more information at**

[www.easy-c.com](http://www.easy-c.com)

[www.easy-c.com/workshop](http://www.easy-c.com/workshop)

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