

# Speed5G

## Newsletter

Issue 5 December 2017

### Editorial

Dear reader,

With this fifth edition of the SPEED-5G newsletter, the project is coming closer to the finish. Accordingly, this edition presents in the Project Highlights section an example for the maturing of its results - the implementation of the novel Filter-Bank Multicarrier (FBMC)-based MAC protocol.

In spring next year, you will get the unique opportunity to learn about our results first-hand, at the SPEED-5G Workshop in London on 7 March 2018. Read more about it in this newsletter.

Finally, we would like to make you aware of our recent publications - a Youtube video in which project coordinator Klaus Mößner explains the key achievements of SPEED-5G and a peer-reviewed paper in the EURASIP Journal on Wireless Communications and Networking.

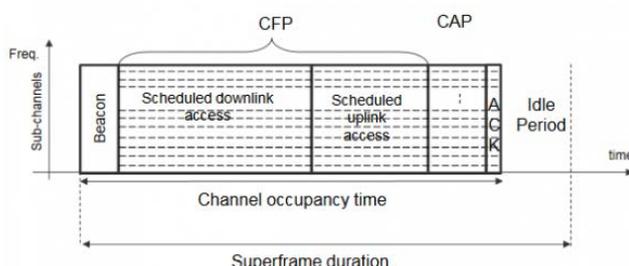
We hope you find the information in our newsletter informative, and we look forward to any questions or comments you may have. The next newsletter edition will be published in March 2017.

Kind regards,

The SPEED-5G consortium

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### Project Highlights



### [Implementation of a dynamic spectrum access protocol](#)

SPEED-5G has done a real-time implementation of the novel Filter-Bank Multicarrier (FBMC)-based MAC protocol, which is capable of dynamic channel switching. The FBMC-MAC protocol has been described in public SPEED-5G deliverables, especially D5.2, "MAC approaches with FBMC". It has now been implemented on a custom HW/SW board designed in CEA, called the Flex board. This board is able to run ...

[Read more.](#)

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## Events



### [Advanced spectrum management in 5G+ networks - Workshop in London on 7th March 2018](#)

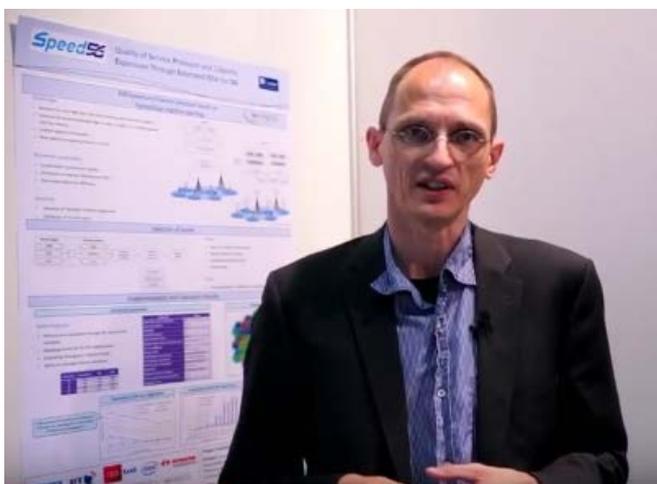
Workshop announcement: Advanced spectrum management in 5G+

networks | Date: March 7th 2018, 10:00 – 17:00 | Venue: BT Centre, 81 Newgate Street, London EC1J 7AJ +++ Register for this free 5G Workshop, and put the date in your diary +++ This workshop, sponsored by the SPEED-5G project and addressed to both industry and academia, reports interesting novel results of ...

[Read more.](#)

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## Publications



### [YouTube video on key achievements of SPEED-5G](#)

In a three-minute YouTube video, project coordinator Klaus Mößner from University of Surrey presents key achievements of SPEED-5G, including the results on eDSA (extended Dynamic Spectrum Access) and the definition of a new

MAC (Medium Access Control). The brief overview presentation was recorded at EuCNC 2017 in Oulu, Finland, and the video was published by the To-Euro-5G project in October ...

[Read more.](#)

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### [SPEED-5G paper on context-aware radio resource](#)

# management

In September 2017, the reputable EURASIP Journal on Wireless Communications and Networking (EURASIP JWCN) published a peer-reviewed open access paper by SPEED-5G. The paper describes project results on “Context-aware radio resource management below 6 GHz for enabling dynamic channel assignment in the 5G era”. In the paper, the SPEED-5G authors propose an algorithm for enabling dynamic channel assignment in the

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[Read more.](#)

Belikaidis et al. EURASIP Journal on Wireless Communications and Networking (2017) 2017:162  
DOI 10.1186/s13638-017-0646-6

EURASIP Journal on Wireless Communications and Networking

RESEARCH Open Access

## Context-aware radio resource management below 6 GHz for enabling dynamic channel assignment in the 5G era

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**Abstract**  
Heterogeneous networks constitute a promising solution to the emerging challenges of 5G networks. According to the specific network architecture, a macro-cell base station (MBS) shares the same spectral resources with a number of small cell base stations (SBS), resulting in increased co-channel interference (CCI). The efficient management of CCI has been studied extensively in the literature and various dynamic channel assignment (DCA) schemes have been proposed. However, the majority of these schemes consider a uniform approach for the users without taking into account the different quality requirements of each application. In this work, we propose an algorithm for enabling dynamic channel assignment in the 5G era that receives information about the interference and QoS levels and dynamically assigns the best channel. This algorithm is compared to state-of-the-art channel assignment algorithms. Results show an increase of performance, e.g., in terms of throughput and air interface latency. Finally, potential challenges and way forward are also discussed.

**Keywords:** Dynamic channel assignment, Channel segregation, Quality of service, Heterogeneous networks, 5G

**1 Introduction**  
5G is characterized by the challenges of rapid growth in mobile connections and traffic volume [1, 2]. To address these challenges, the European project SPEED-5G (standing for quality of service provision and capacity expansion through extended-DSA for 5G) focuses on the efficient exploitation of wireless technologies so as to provide higher capacity along with the ultra-densification of cellular technology [3]. Under the framework of SPEED-5G, novel techniques for optimizing spectrum utilization will be developed, following three main dimensions: (i) ultra-densification through small cells, (ii) load balancing across available spectrum, and (iii) exploitation of resources across different technologies. Considering the specific three-dimensional model, which is referred to as extended-dynamic spectrum allocation (eDSA), different spectrum bands and technologies can be jointly managed so as to improve the users' quality of experience (QoE). Hence, the ultimate goal of

SPEED-5G boils down to the development of a dynamic radio resource management framework, including mechanisms for interference control, coexistence of heterogeneous networks, management of spectral resources in lightly licensed bands, and other smart resource allocation schemes. It is worth mentioning that this work is an extended version of the work published by the authors in [4, 5].

One of the main scenarios addressed in SPEED-5G is the case of heterogeneous networks where a massive deployment of small cells is put into place to deliver a uniform broadband experience to the users, considering applications with different QoS requirements, such as high resolution multimedia streaming, gaming, video calling, and cloud services. A significant challenge in these networks is the efficient management of co-channel interference (CCI) that occurs due to proximity among the SBSs. Hence, given that the same channels are reused among SBSs due to the scarce spectral resources, CCI constitutes an important restrictive factor for the network performance.

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## Imprint

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