An efficient solution to coping with the mobile data revolution

The EU-funded DUPLO project is ensuring that the next generation of mobile phones can cope with the expected massive increases in data traffic.

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Cutting edge research into developing mobile communication technology that uses limited radio bandwidth in a more efficient manner is being presented by the EU-funded DUPLO project at the Mobile World Congress in Barcelona, Spain, which runs from 2 to 5 March 2015.

The DUPLO project has sought to develop practical solutions to coping with massive increases in mobile traffic volumes, along with an anticipated explosion in the number of wireless devices. Mobile and wireless traffic volume is expected to increase a thousand-fold by 2020 compared with 2010.

Adequate infrastructure is needed to cope with this forecasted increase in traffic, much in the same way that Europe's road network has had to be upgraded to meet the rapid increase in the number of cars on the road. Furthermore, the sheer variety of applications and traffic types originating from or reaching our mobiles will soon be significantly larger than today, and will result in more diverse requirements on services, devices and networks.

The solution devised by DUPLO aims to make better use of available bandwidth in an energy efficient manner through what is known as full-duplex radio transmission. This technology enables the same carrier frequency to be used for data transmission and reception at the same time, allowing more data to travel within the same radio bandwidth.

At the Barcelona event, a stand-alone multiband electrical-balance duplexer is being

presented as a viable alternative to fixed frequency surface-acoustic wave (SAW) filters which currently feature in mobile phones. ‘Our solution paves the way to integrated reconfigurable multiband front-end modules for frequency division duplexing in next-generation mobile phones,’ said Joris Van Driessche, programme manager of reconfigurable radios at IMEC, a partner in the DUPLO project.

Indeed, sending and receiving at the same time on the same frequency band opens up new possibilities for improving wireless communication system performance and introducing full-duplex transmission to future 5G (fifth generation) systems. This will also help Europe continue to be a pioneer of the mobile communications revolution, which is driving major technology breakthroughs ranging from wearable devices to connected cars and homes.

In order to get to this point however, the DUPLO project team first had to deal with challenges such as the issue of self-interference caused by transmitting and receiving on the same bandwidth. Technical solutions were studied and developed in order to enable full-duplex transmission to function in a variety of wireless communications networks, including mobile devices.

A proof-of-concept test platform was then established to integrate these technical solutions together into a functional full-duplex communication system.

The two and a half year DUPLO project, which has received EUR 3.3 million in EU funding, is scheduled for completion at the end of April 2015. Final findings will be discussed at a conference in Glasgow, Scotland in May 2015.

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DUPLO
http://www.fp7-duplo.eu/index.php

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