Dynamic Optical Fiber Delivery of Ka-Band Packet Transmissions for Wireless Access Networks

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FiWiN5G

METRO-ACCESS
& SHORT RANGE COMMUNICATIONS

Agenda

» Motivation.

» Proposed Architecture.

» Experimental Setup.

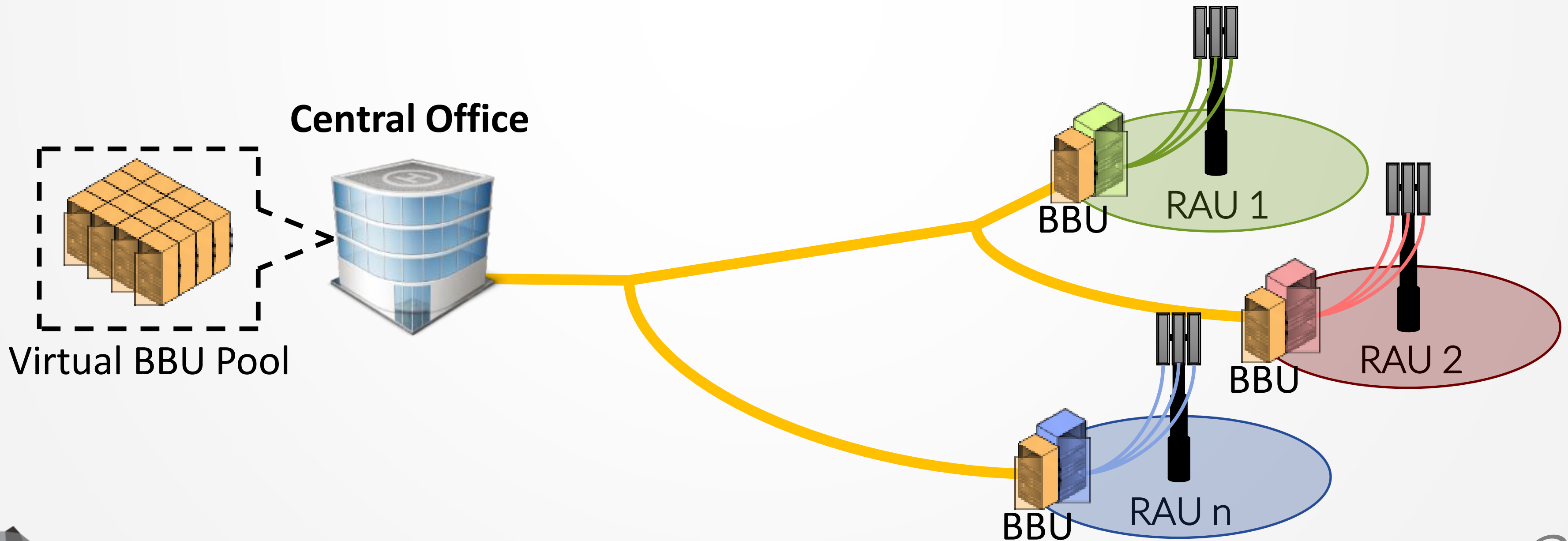
» Experimental Results.

» Conclusions.

The Access Network is changing

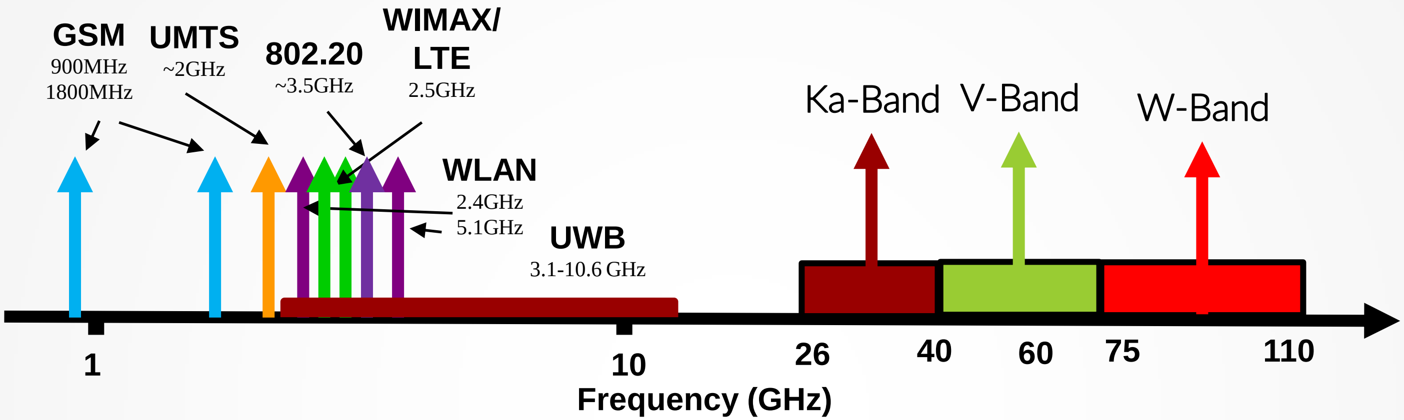
RoF based C-RAN

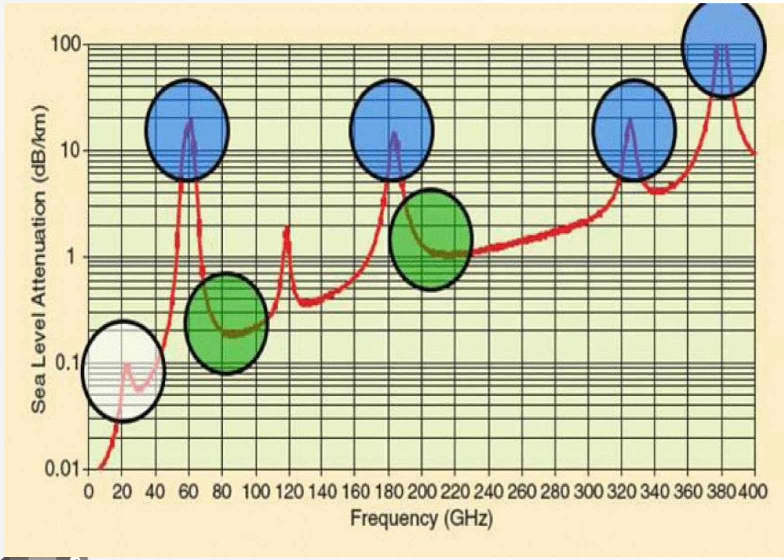
- The processing In the RAN is being centralized. Moving the BBUs to the Central office.
- The wireless signal is directly distributed to the antenna using Analogue Radio-over-Fiber
- Higher wireless carrier frequencies are going to be used



Millimeter-wave Carrier frequencies

» Increased capacity by applications in higher frequency bands





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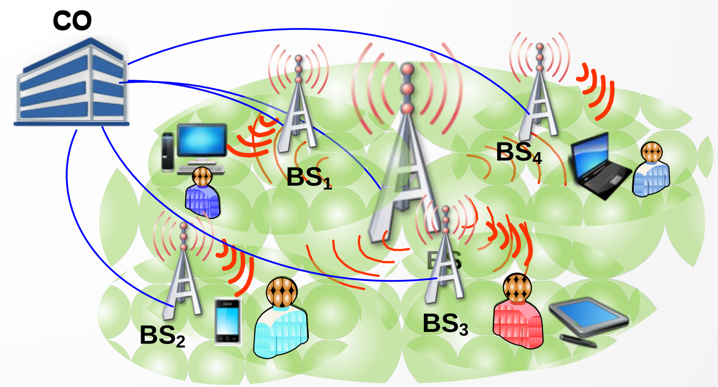
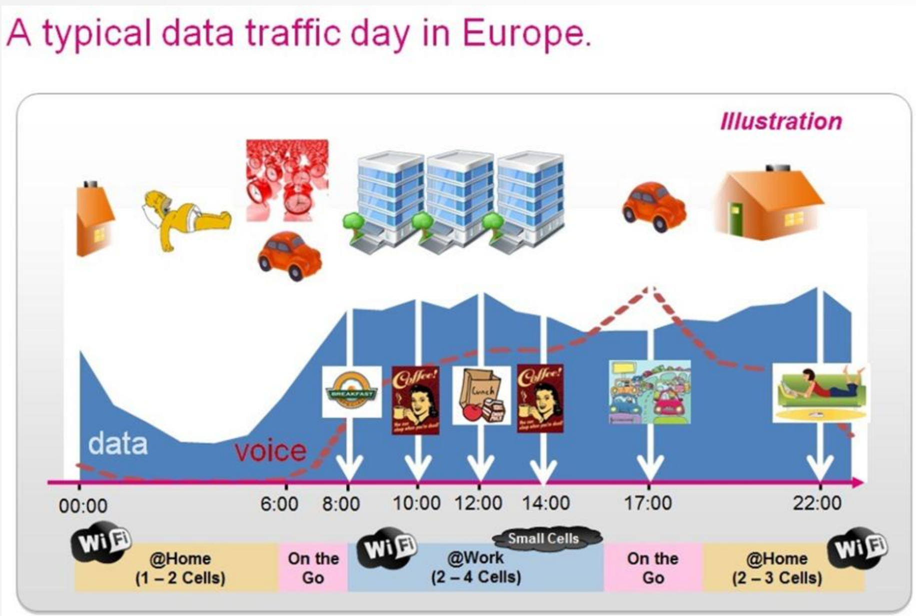
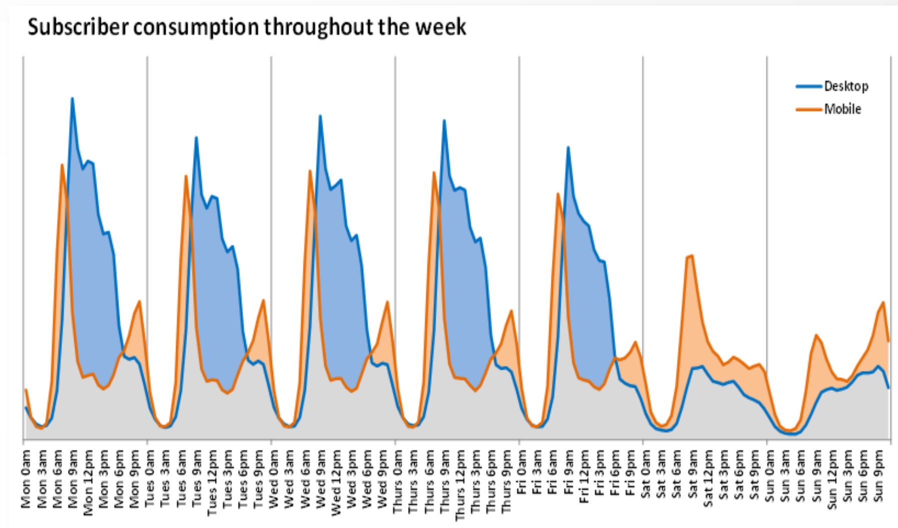


CO: central office
BS: base station

Dynamic Traffic

» Traffic is dynamic (well-known fact)

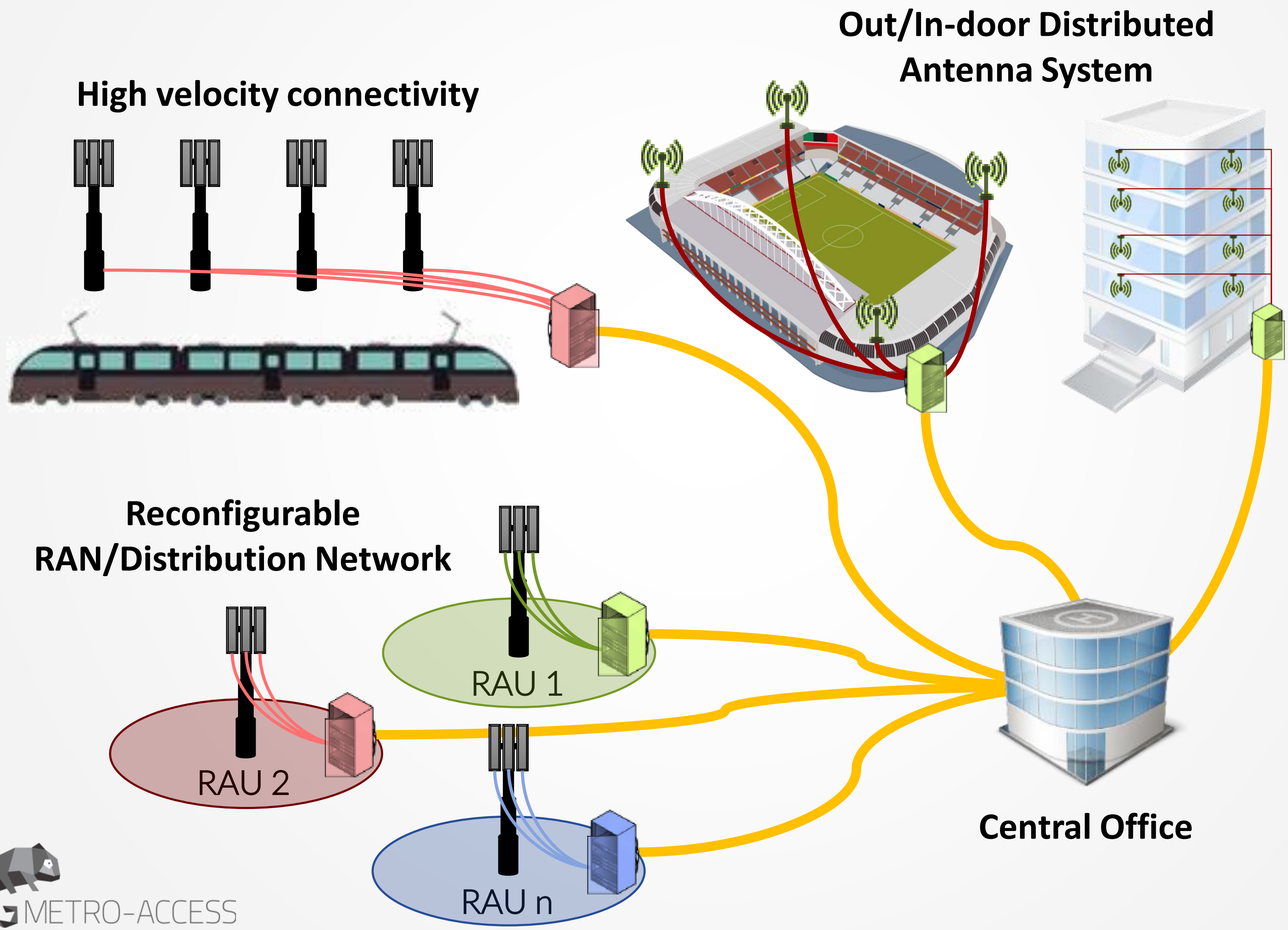




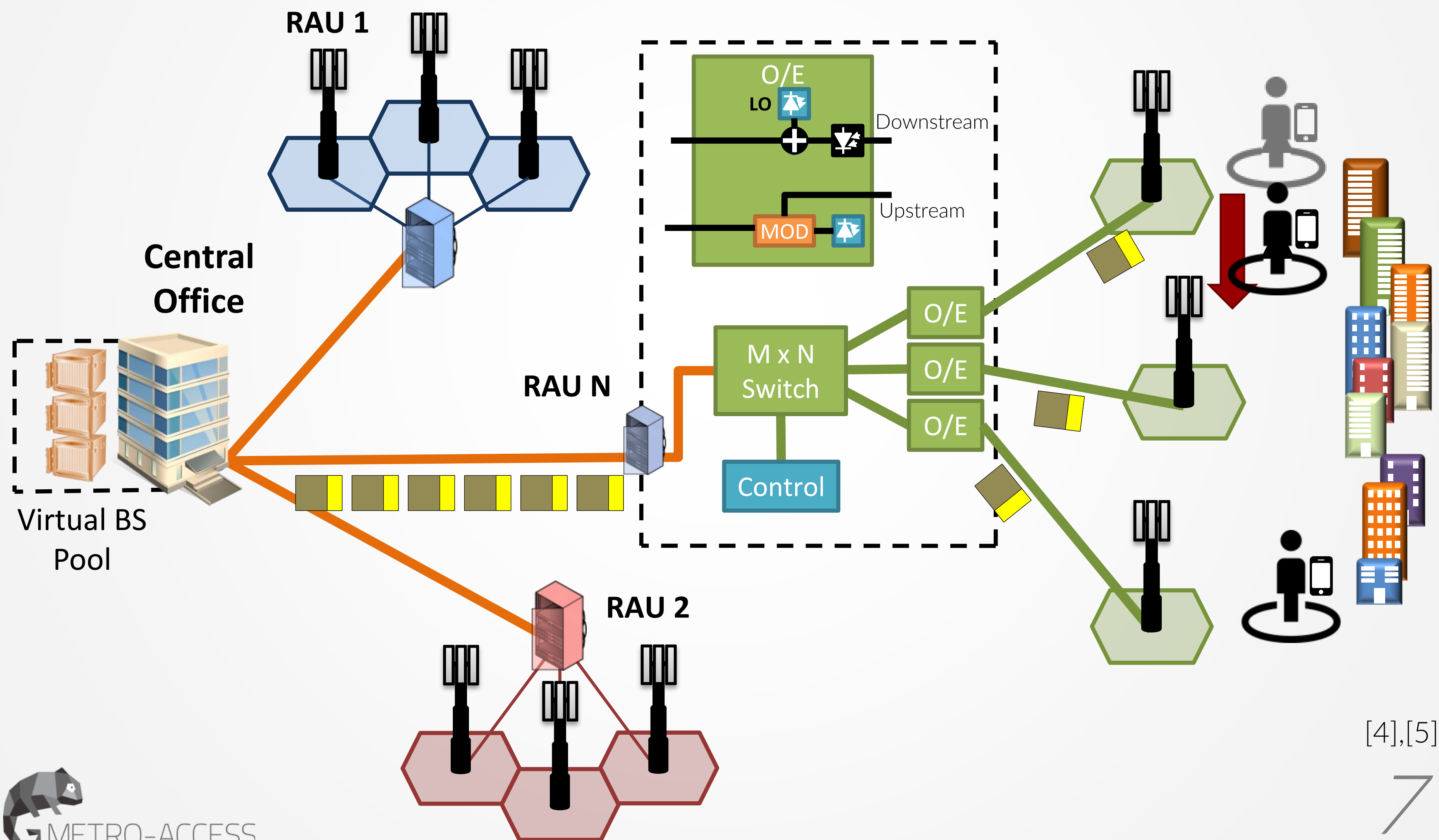
» Emergence of reconfigurable networks

- » Elasticity , efficiency, dynamic and planned adaptation…
- » Software defined optics

Flexible Access Network



Dynamic distribution in the C-RAN



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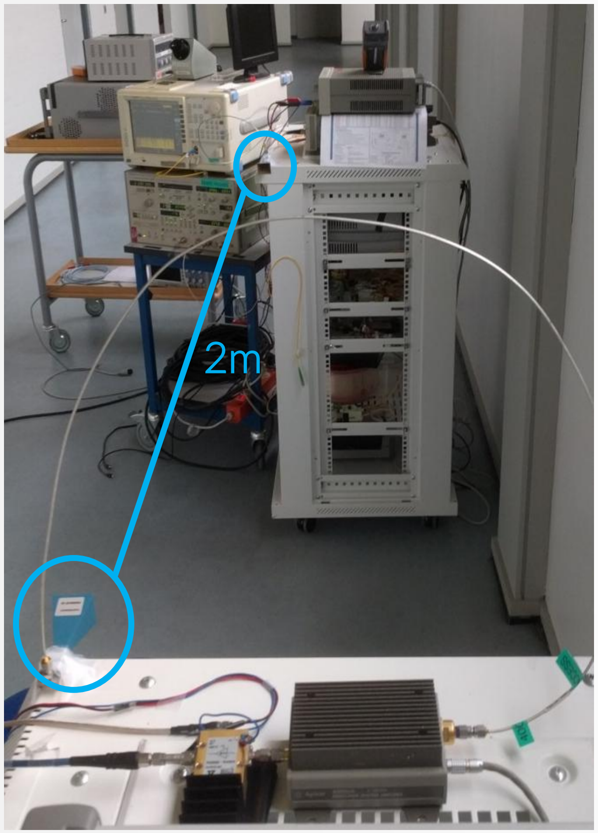
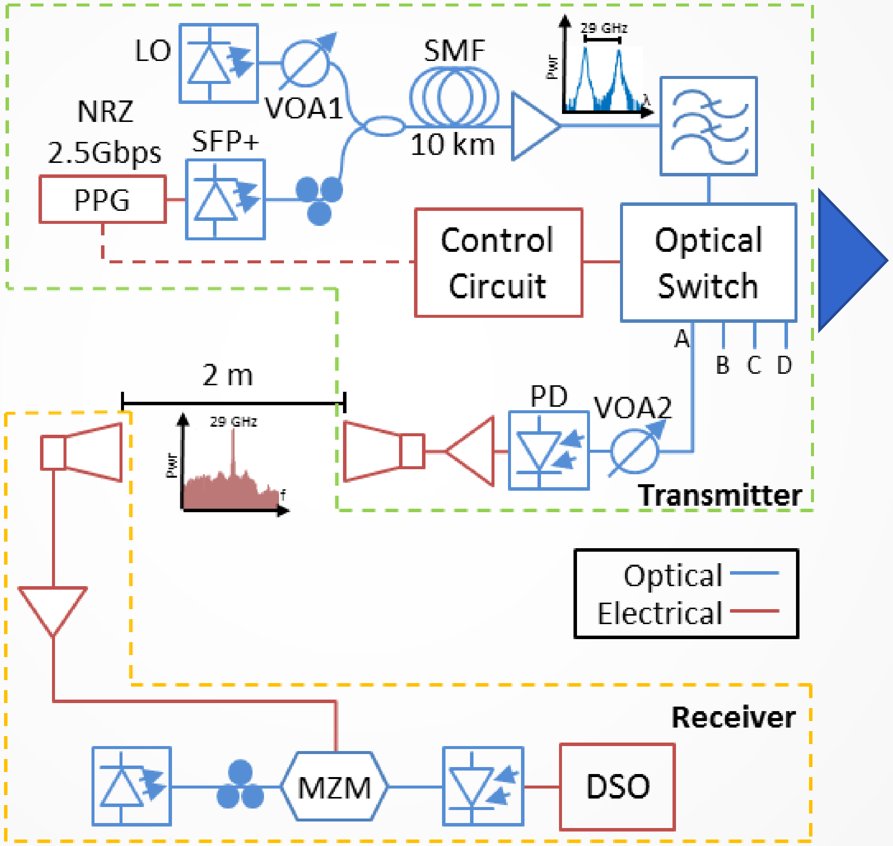
Experimental setup



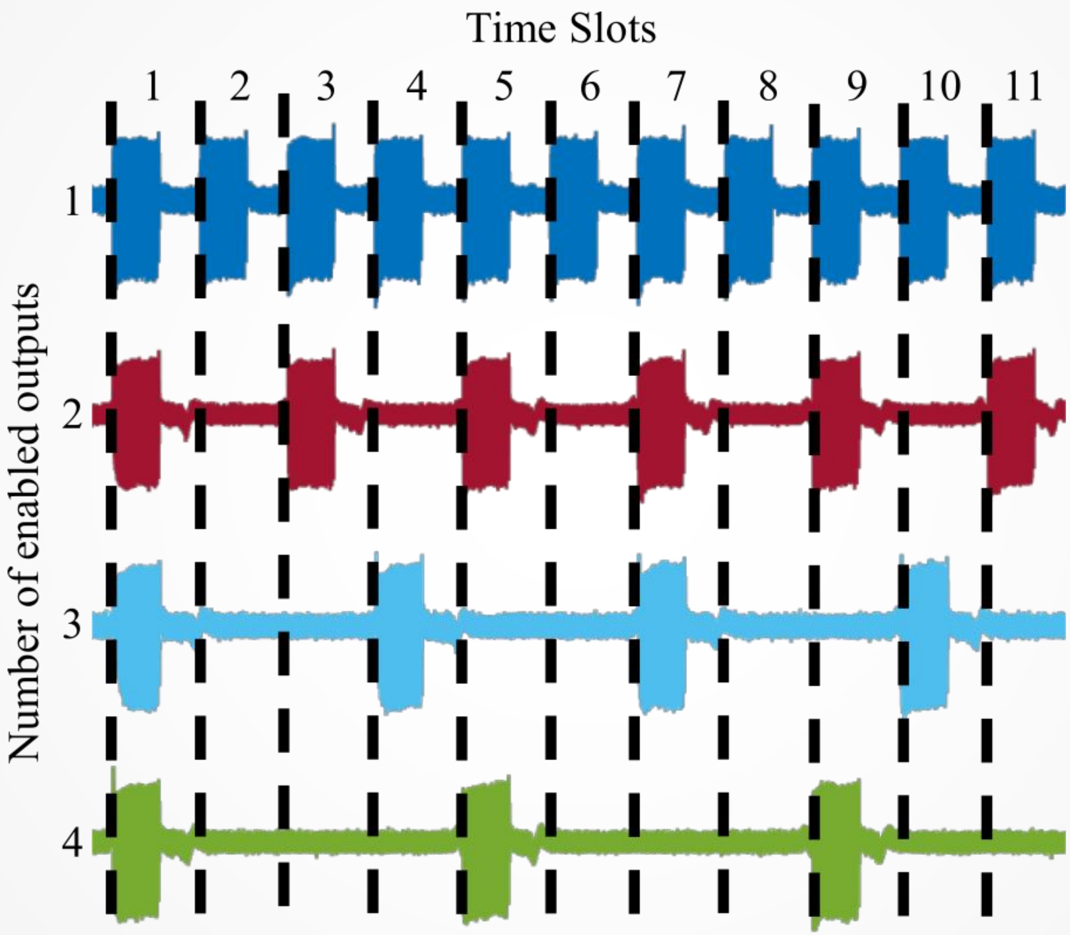


Control Circuit

MEMS Optical Switch

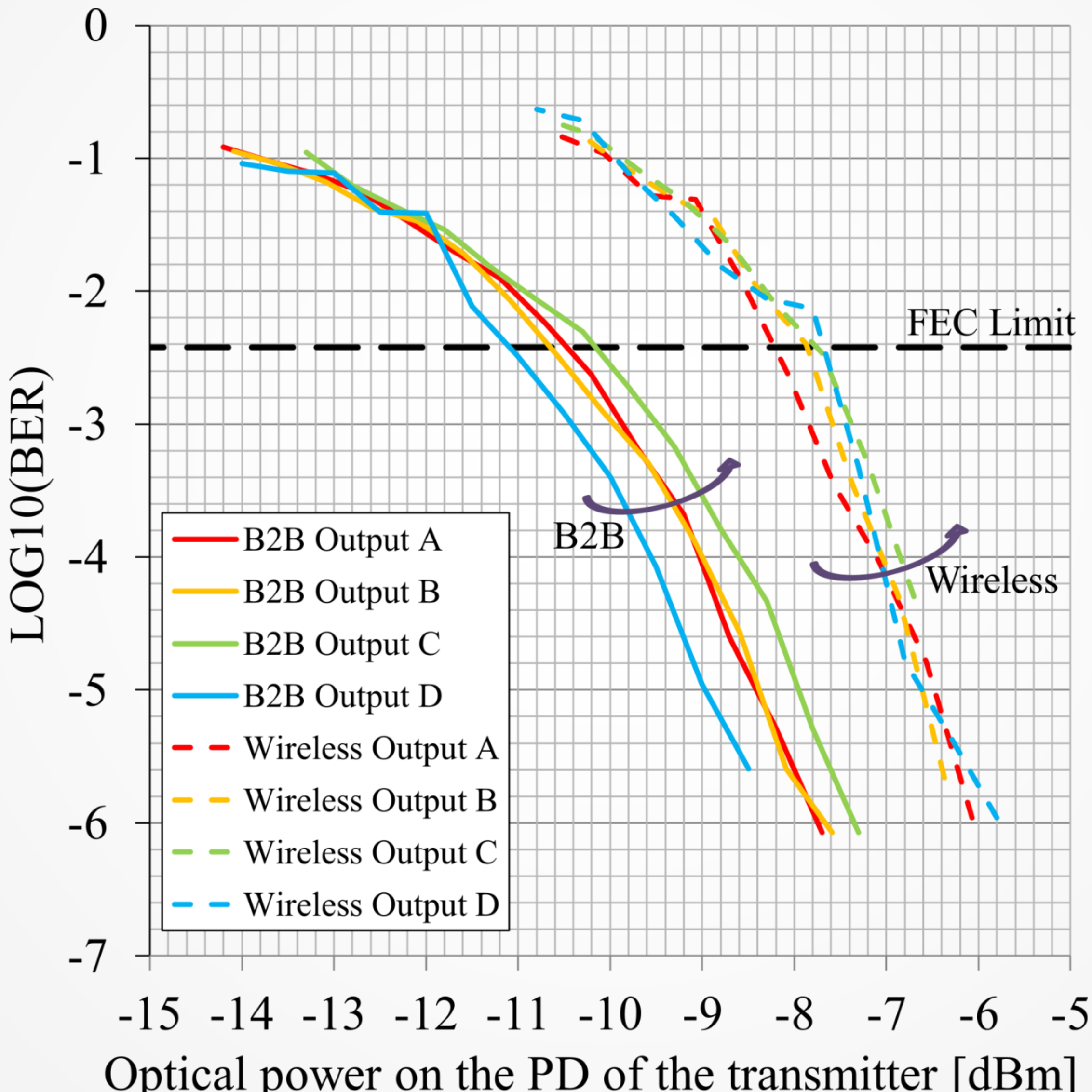
Time Slots

Experimental Results



BER Performance

Experimental Results



METRO-ACCESS

Conclusions

- An optical switching system to dynamically deliver the signal of an optically generated Ka-band (26.5 – 40 GHz) transmission has been presented and experimentally evaluated.
- The resulting RF packets have been transmitted over a wireless distance of 2 m, presenting values below the limit for 7% overhead with a measured sensitivity of -8.2 dBm. The main penalty is the effects of the attenuation of the wireless channel.
- The implementation of this kind of switches will enable an extra layer of management and control to the future wireless centralized radio access network.

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