

Challenges to GaN based wireless systems for 5G and beyond.

Realising a ubiquitous wireless system capable of handling petabytes of data, hinges on the promise of highly efficient semiconductor devices and circuits that currently do not exist. One of the most power-hungry blocks in a communication system is the amplifier whose efficiency, bandwidth and linearity have a biggest impact on the overall system efficiency. 5G systems rely on arrays of antennas with multiple RF front-ends for beam forming. The ubiquity of CMOS integration has resulted in many applications of 5G front-ends, being partially or completely implemented in low cost silicon-based technology using digital techniques for PA design. This talk focuses on the benefits of contiguous mode Class B/F⁻¹ amplifiers designed using analogue techniques. Contiguous modes offer significant benefits such as tolerance to impedance mismatch, resulting in high yield and broadband characteristics. Their ease of design offers attractive opportunities for more efficient semiconductors such as GaN in future applications of 5G. Nevertheless, there are many challenges still to overcome for GaN based wireless systems of the future.