

# The Impact of Higher Order Sectorisation on the Performance of Millimetre Wave 5G Network

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## **Abstract:**

*To cope with massive growth over the past decade experienced by mobile network due to the popularity of smartphones and tablets, 5G networks are anticipated to use larger amounts of electromagnetic spectrum, spanning all the way from the microwave (sub 3GHz) to the millimetre wave (mmWave) bands (3–300 GHz). However, moving to the mmWave band will increase the exposure of users to high power/frequency radiation. This paper discusses the regulatory requirements at mmWave band. In this work, the performance of Cloud-Radio Access Network (C-RAN) network with uniformly distributed Remote Radio Heads (RRHs) was investigated and compared with default network architecture. This work provides insights on how to minimise the exposure to mmWave radiation in C-RAN network using Low-Power Nodes (LPN) by adopting Distributed Base Station (DBS) architecture. DBS can use remotely located low power antennas to extend the coverage of mmWave base stations. The results show that this architecture can significantly reduce the exposure to mmWave radiation without compromising the quality of service of C-RAN network, where the data throughput improvement is shown as the performance metric.*