

## ABSTRACT:

Inter cell interference (ICI) is a major challenge that degrades the performance of mobile systems, particularly for cell-edge users. This problem arises significantly in the next-generation system, as the trend of deployment is with high densification, which yields an ultra-dense network (UDN). One of the challenges in UDN is the dramatic increase of ICI from surrounding cells. A common technique to minimize ICI is interference coordination techniques. In this context, the most efficient ICI coordination is fractional frequency reuse (FFR). This paper investigates the FFR in UDN millimeter wave network at 26-GHz band. The focus is on dense network with short inter site distance, and higher order sectorisation (HOS). The metrics used in frequency reuse is the signal to interference plus noise ratio rather than the distance, as the line of sight in millimeter wave can be easily blocked by obstacles even if they are in close proximity to the serving base station. This paper shows that FFR can improve the network performance in terms of per user cell-edge data throughput and average cell throughput, and maintain the peak data throughput at a certain threshold. Furthermore, HOS has a potential gain over default sectorised cells when the interference is carefully coordinated. The results show optimal values for bandwidth split per each scenario in FFR scheme to give the best tradeoff between inner and outer zone users performance.