

**Performance analysis of millimeter wave 5G networks for outdoor  
environment: propagation perspectives  
spectrum sensing**

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**Abstract:**

*To cope with the massive growth in global mobile data traffic for 2020 and beyond, the fifth generation (5G) system is required to be developed as the current 4G system is expected to fall short behind the provision of such growth. 5G systems is anticipated to use millimeter wave (mm-wave) frequency bands (20 to 90) GHz, due to the availability of wide chunk of unexploited bandwidth. This is revolutionary step to use these bands because of their very different propagation conditions, atmospheric absorption and hardware constraints. However, such challenges could be compensated by means of beamforming/beamsteering and larger antenna array. In this paper, a comparative study aided with ray-tracing simulation has been performed to assess the feasibility of mm-wave in 5G system. Propagation characteristics of the 28GHz and 73 GHz bands have been studied and compared in a street canyon outdoor environment to simulate 5G outdoor mobile access. Simulation results were shown along with their comparison for both of the aforementioned frequencies. The results of propagation comparison have been reported in terms of path loss, k-factor, delay spread and received power for both 28 and 73 GHz bands.*