A Vectorial Analysis of UHF Propagation in a Three-dimensional Multislit Street Scene using Ray-tracing

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ABSTRACT

In dense urban environments it is usual to have buildings placed on both sides of the streets constituting a waveguide channel. In this work we present a vectorial analysis of the three dimensional (3D) street waveguide model in the UHF band using ray-tracing techniques. The street is then modeled as a 3D multislit waveguide and an ideal dipole is assumed to be the transmitting aerial. Horizontal and vertical polarizations are investigated in terms of direct incidence, ground reflection and multiple reflections on the lateral borders of the waveguide. After that, a comparison between different transmitting aerial heights is performed. Finally, slits are inserted and comparisons and analysis are provided. Once all descriptions are congregated into a theoretical model, it can be used to analyze the performance of a practical implementation before in fact implementing it.

References


