

SOURCE: SIRADEL, Saint-Grégoire, France
SIRADEL North America, Toronto, Ontario, Canada

Blockage modelling for evaluation of a 60 GHz Dense Small-Cell Network Performance

Ray-based and hybrid propagation models are today considered as valuable solutions to fulfill 5G wireless channel modeling requirements. They are a complement or alternative to the stochastic approaches when link-level and system-level simulations deal with millimeter-wave (mmWave), ultra-dense deployment and/or large antenna arrays. The present article proposes an extension of an urban ray-based model for the assessment of a 60-GHz outdoor small-cell network. The multi-paths are predicted from interactions with the static environment, but also with randomly-positioned vehicles and user-bodies. Both the vehicles and the user-body generate ray-path blockage, and (in case of the vehicle) new propagation paths. This sometimes affects the cell selection or beam orientation, and significantly changes the received signal strength and inter-cell interference. In this paper, the blockage effect is first modelled and assessed in simple scenarios before it is introduced into a whole mmWave small-cell network simulation via a stochastic process. The impacts on the signal strength, interference level and the signal-to-interference ratio are evaluated and discussed.

Mohammed Zahid Aslam¹, Romain Charbonnier¹,
Yoann Corre¹, Yves Lostanlen²

¹SIRADEL
2 parc de Brocéliande
35760 Saint-Grégoire, FRANCE
²SIRADEL North America
120 Eglinton avenue East
Toronto ON M4P 1E2, CANADA
Phone: + 33-2 23 480 500
Email: yves.lostanlen@ieee.org