

Impacts of Room Structure Models on the Accuracy of 60 GHz Indoor Radio Propagation Prediction

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Abstract:

Accurate indoor radio wave propagation prediction requires a model of the environment which also includes fixtures such as furniture. By laser scanning we can obtain this detailed structural data in the form of a point cloud. Since conventional field prediction tools are not applicable to the point cloud data format, we predict the electromagnetic scattering by using a single-lobe directive scattering model which can be used directly with the point cloud. The focus in this paper is to study how the density of the point cloud affects the prediction accuracy. It is shown that a point cloud density of only 2×10^{-4} points per square wavelength is enough at 60 GHz in order to achieve good prediction accuracy between measured and predicted delay and angular spreads.