

# Performance Analysis of Heterogeneous Wireless Networks in Complex Indoor Scenarios

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The exponentially growth of the use of wireless communication systems has led to the need of adequate and efficient tools, not only to predict radio wave propagation in different environments, but also to analyze the Quality of Service (QoS) of the wireless link. The capability of determining optimum base-station/hot-spot locations with the minimum energy consumption, as well as the analysis of the coverage and capacity of the wireless system is essential before the deployment of a wireless network. The QoS in a wireless network for a highly complex indoor environment is presented in this work. For that purpose, an in-house developed 3D ray launching code has been used, obtaining estimations of energy consumption for the transceivers, as well as bit error rate and signal to noise ratio for different data rates and interference levels as a function of position for the complete volume of the scenario for multiple wireless systems. The proposed method can aid in the study of the channel quality in order to optimize the service performance for the future deployment of different wireless systems, specifically in high density scenarios such as Wireless Sensor Network deployments in Context Aware Scenarios and HetNet deployments.

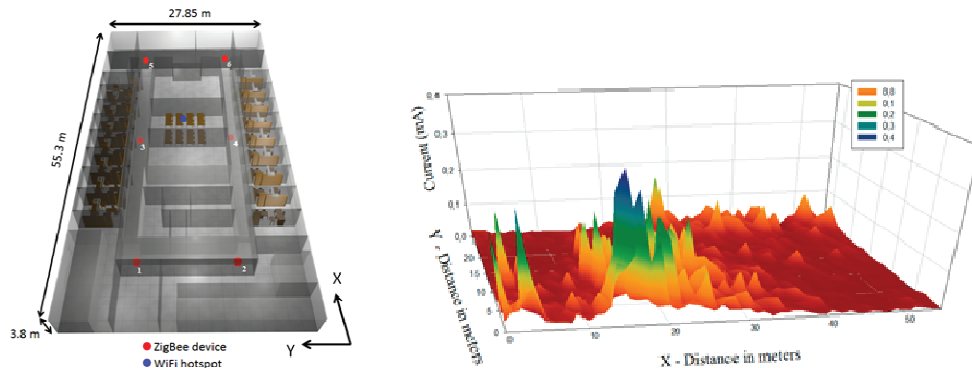


Figure 1. Schematic view of the considered complex indoor scenario (left). Estimated overall current consumption increase for each receiver location at 2m height plane (right).

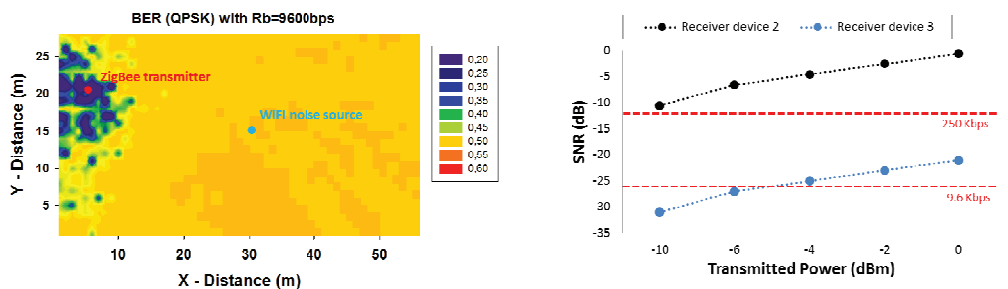


Figure 2. Estimated BER for 9.6 Kbps ZigBee transmission data rate (left). Estimated SNR values at the positions of ZigBee devices 2 and 3 when transceiver 1 is emitting (right).