Convergence Performance of Deterministic 3D Ray Launching Approach in Complex Indoor Environments

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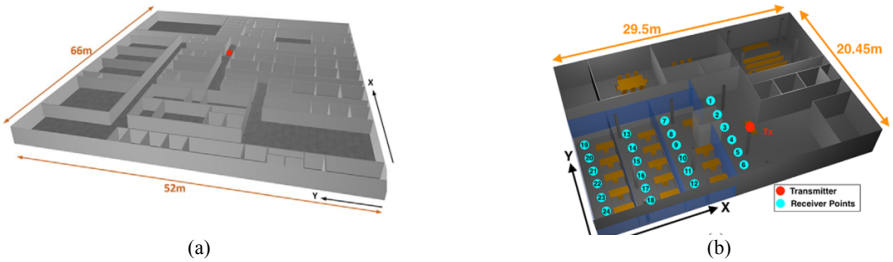
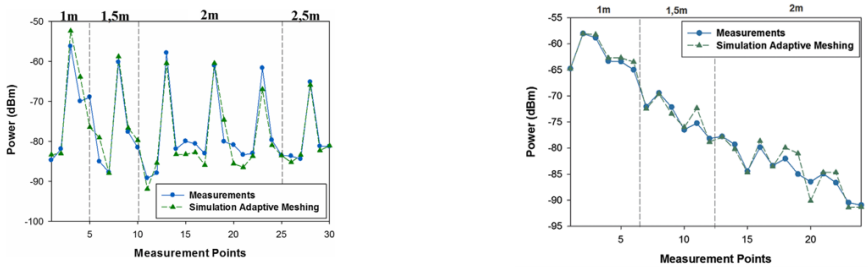
With the growing demand for wireless communication systems in the last two decades a radio electrical planning of wireless communication systems is highly required. Thus, an in-depth investigation of indoor propagation channel characteristics represents a fundamental step toward the design and the implementation for an efficient setup of an indoor wireless network. Deterministic models potentially represent the most accurate and versatile methods for urban and indoor, multipath propagation characterization or prediction. It has been shown in the literature that the size of the scenario strongly impacts algorithm convergence in deterministic methods. This is due to the fact that when vast and complex scenarios are analyzed, it is necessary to implement adaptive meshing into Ray Launching (RL) techniques, to avoid algorithm divergence. In this work, a meshing convergence analysis of an in-house 3D RL code has been done. Fig. 1 represents the schematic view of the considered scenarios for the meshing analysis and Fig. 2 represents the optimal adaptive meshing to be used with the 3D RL code for these large complex scenarios.



(a) (b)

Figure 1. Schematic view of the considered scenarios (a) First scenario (b) Second scenario



(a) (b)

Figure 2. Comparison between simulation and measurements with optimal meshing (a) First scenario (b) Second scenario