



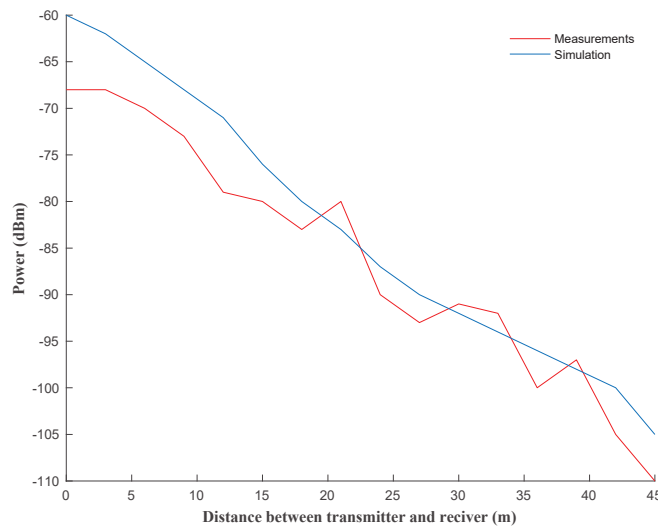
## Modelling radio wave propagation for wireless communication systems

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### Extended Abstract

The modelling of signal propagation is essential to designing a robust communication network. The performance of the modelling process depends on the way in which the model has been constructed, such as its empirical and theoretical assumptions. In all cases, the various propagation issues need to be taken into account to make the process as reliable as possible. These include reflection, refraction, scattering, diffraction and ducting. In this paper, a model has been proposed for wireless terrestrial propagation. The model consists of a set of steps starting from the transmission points, then passing through the propagation medium until reaching the receiver. A ray-tracing method has been suggested in order to follow the signal path in addition to different considerations to estimate the received signal characteristics. Finally, the output will be compared with measurements of wireless signals under different scenarios. Further developments to the model are required to take into account the effects of different environment types. An example of the outcomes is shown below, which illustrate the received power in dBm for both empirical observations and modelling.



**Figure 1:** received power for measurements and simulations in terms of the distance between transmitter and receiver.