Abstract

The ability of Multi-Input Multi-Output (MIMO) antenna systems to increase the capacity of Wi-Fi based outdoor links has been studied extensively. MIMO can also be used to increase transmission distance for a fixed data rate, a fact which is of great practical importance. This work studies the distance increase as a function of the desired data rate.

Plots of the rate as a function of distance for MIMO systems with different numbers of antennas has been provided, as well as for Single-Input Multiple-Output (SIMO), Multiple -Input Single-Output (MISO) and Single-Input Single-Output (SISO) systems as a reference. The results are produced by evaluating a well-known MIMO capacity formula where the average SNR is computed using Green-Obaidat propagation loss models. It is shown that significant coverage increase can be achieved by MIMO systems with relatively small numbers of antennas (2×2, 3×3 and 4×4 in the examples presented).