Experimental Investigation on Joint Spatial and Polarization Cross-Correlation of Propagation Channel in Indoor Distributed Antenna Systems

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Abstract:

Distributed antenna systems (DAS) have been proposed in wireless communications for the benefits of reducing the power consumption and enhancing system capacity owing to spatial diversity gains. The effectiveness of the spatial diversity is closely rely on the low cross-correlation of the large-scale fading of multiple links in the system. In this contribution, the fading correlations under different configurations of antennas are analysed and compared based on the measurements data collected in indoor environment. The results show that for some indoor scenarios, such as corridor and the scenarios where transmitting antennas are distributed symmetrically with respect to both the receiver and the propagation environment, the spatial correlation is nonnegligible. In these cases, an additional polarization diversity by using dual-polarized antennas can effectively reduce the fading cross-correlation and enhance the capacity gain of the DAS.