Full-Polarimetric Distance Dependent Model for Large Hall Scenarios

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Abstract:

The distance-dependent polarimetric characteristics of a large open hall radio channel are investigated under Line-of-Sight conditions at 1.3 GHz. The measured radio channels were processed by the high-resolution parametric estimator RiMAX to estimate both the polarimetric specular multipath components (SMC) and dense multipath components (DMC). Full-polarimetric distance-dependent path gain and reverberation ratio models are proposed from which the depolarization mechanisms are presented. A two-step method is proposed to compute the path loss exponent of the estim ated components from the measured data. This approach provides a deeper understanding of the indoor radio channel when including DMC. In addition, it is demonstrated that the room electromagnetics theory applies to our scenario across all polarization links with DMC to total power ratio values ranging between 20% and 100%. The validity of the proposed approach is provided by the good agreement between the polarimetric data and models. Furthermore, the results highlight the fact that a complete polarimetric description of all propagation mechanisms is desired in polarimetric radio channel models.