

Indoor Channel Estimation Using Single-Snapshot Wideband Measurement

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Abstract

The successful design of communication systems generally requires knowledge of various channel characteristic parameters. This paper utilizes the reverberation time extracted from single-snapshot wideband measurement to estimate different indoor propagation parameters based on the room electromagnetics theory. The indoor room environment is conceived as a lossy cavity that is characterized by the diffuse scattering components resulting from the surrounding walls and objects and possibly a line-of-sight (LoS) component. The main advantages of the room electromagnetics based approach are simplicity and good accuracy. The approach needs only one wideband measurement in order to extract the reverberation time in addition to some dimensional information on the investigated room to predict various important channel parameter of great importance. The measurements show good agreement with the theoretical predicted results.