

Physical-Statistical Channel Model for Off-body Area Network

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Abstract

In this letter, a physical-statistical-based channel model for off-body wireless communications is presented. The model utilizes a dynamic human walking model, which provides detailed description of the movement of the different body parts. The received signal is composed of a direct component, which might be subject to shadowing by the body parts, and a multipath component due to reflections from the environmental scatterers. The uniform theory of diffraction (UTD) is utilized to accurately calculate the time-varying shadowing and scattering effects of the direct signal due to the moving of body parts. A Rayleigh distribution is used to represent the multipath fading effects by the scatterers around the human body. The model is validated in terms of first- and second-order statistics using 2.36 GHz measurement data, showing good agreement.