A Path Shadowing Model Representing Human Activity Effects in Indoor Environments

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This paper presents a path-shadowing model in indoor populated environments based on computer simulations. The propagation paths between the transmitting and receiving points in an empty rectangular space are determined by a ray tracking method, moving quasi-human bodies modeled as a cylinder with finite are generated in this space, and intersections of the paths with the bodies are counted. As a result, the shadowing probabilities, durations, and intervals are evaluated for each propagation path, and this shadowing process is characterized as a Markov process. This paper proposes a method for individually generating the shadowing effects on each propagation path. The measurement results of path shadowing characteristics using a photoelectric sensor are also presented, and the validity of this model is confirmed.