Statistical channel models for 60 GHz radio propagation in hospital environments

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Abstract:

Radio channel models for 60 GHz very-high-speed radio systems in hospital environments are presented. Two possible applications of those systems have been considered: real-time video streaming for angiography and ultrasonic imaging. Channel modeling was performed for delay domain multipath characteristics based on extensive radio channel measurement campaigns in angiography and ultrasonic inspection rooms. The measurement results revealed that the shapes of the power delay profiles in the angiography and ultrasonic imaging rooms were significantly diffe rent from that reported in the IEEE802.15 TG3c and IEEE802.11 TGad channel models. For this reason, novel model structures were developed to model radio channels in these hospital scenarios accurately. Statistical descriptions of the channel model parameters are given based on the measurements, and, finally, implementation guidelines of the channel models are provided. The channel model validation results show a good agreement of root-mean-square delay spread between channel model outputs and channel measurements. The channel model is useful for the performance evaluation of the wireless systems in hospital environments.