Towards a Radio Channel Model for Off-Body Communications in a Multipath Environment

Author(s) - Institution(s):
Michal Mackowiak, IST-TUL
Luıs M. Correia, IST-TUL

Corresponding author email: michal.mackowiak@gmail.com

Corresponding WG group: TWGB

Abstract:

This paper introduces a radio channel model for off-body communications in a multipath environment. The modelling of wearable antennas in Body Area Networks has been separated into antennas in the vicinity of the body (full wave simulations), including body dynamics (taken from motion capture analysis), and street environment (clusters of scatterers). Multi-Path Components are calculated using a Geometrically Based Statistical Channel model. A street scenario is simulated, for a running or walking body, and for 4 on-body antenna placements (i.e., front of the head, left and right arm, and back). The propagation conditions are determined (i.e., LoS or NLoS) and statistics of b asic radio channel parameters (i.e., received power, delay and angular spreads) are calculated. The received power depends strongly on propagation conditions, and varies a lot in the case of antenna placement on the left hand and Run scenario (standard deviation of 5.4 dB). For this antenna placement, the average delay spread is the lowest, 88 ns, but varies a lot, depending on the location in the environment and the body posture (standard deviation of 25 ns).