Comparison of UWB On-Body WBAN Radio Channels Between Various Test Persons - Preliminary Results

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Abstract:

This paper examines differences between wireless ultra wideband radio channels when various test persons are measured. The work bases on static on-body measurements conducted in an anechoic chamber at the frequency range of 2-8 GHz by using a vector network analyzer. Three male and one female test persons were measured. The study was repeated by using two different planar antenna types: dipole and double loop that were attached to four antennas positions on the body. From the resulted frequency domain data, the corresponding time-domain channel impulse responses (CIRs) were solved. First, the path losses of the first ar riving paths were compared. Depending on the link type, the path losses behaved differently between the test persons. The average path loss exponent was noted to decrease as the body size increased. The results of the male and female with the same body sizes are similar. Secondly, the excess delays of the CIRs were found out. The excess delay increases with larger body sizes among the males. The female has similar result as the largest male. The dipole antenna has, on the average, longer excess delay than the double loop. Finally, the examination of the cross-correlations between the channels show higher values as the body size is increased. No difference exists between the genders with the same body sizes.