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Mm-wave Indoor Channel Cluster Analysis by Multipath Component Extraction from Directional Antenna Scanning

In order to utilize higher frequency bands above 6 GHz which is an important technical challenge in fifth generation mobile systems and ultra-high speed WLANs, radio propagation channel properties in large variety of deployment scenarios should be thoroughly investigated. This paper developed a super-resolution path estimation algorithm to extract multipath components (MPCs) from the measured double-directional impulse responses obtained by directional antenna scanning. Unlike as in virtual array signal processing, the path parameters are directly estimated from the double directional channel impulse responses. From the extracted MPCs, the cluster characteristics in an atrium entrance hall environment at a millimeter-wave band of 58.5 GHz assuming an indoor hotspot access scenario were presented, where the channel transfer functions of a wideband signal with 400 MHz bandwidth were measured by rotating high gain horn antennas with 12 degree half power beamwidth at several receiver positions.

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