Channel measurements and Angle Estimation for Massive MIMO Systems in a Stadium

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***Abstract*—Massive multiple input and multiple output (MIMO) systems can increase the spectrum and energy efficiency of existing cells, and because of this, massive MIMO has been considered as a potential technique for next generation wireless communication networks. Since a thorough knowledge of the propagation channel is a prerequisite of reliable communication systems, massive MIMO channels are of great current interest. However, few investigations have been done on massive MIMO channels, especially for the angle properties. In this paper, based on the realistic massive MIMO channel measurement in a typical stadium environment at 1.4725 GHz, the angle spread properties are investigated. By employing the high resolution angle estimation method MUSIC and space-alternating generalized expectation maximization (SAGE) algorithm, the angular power spectrum in azimuth at each element along the virtual linear array are obtained.**

***Keyword*—Massive MIMO, channel measurement, Angular power spectrum (APS), MUSIC, SAGE, angle estimation;**

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