Study of MIMO Capacity for Linear Dipole Arrangements using Spherical Mode Expansions

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Multiple-input multiple-output (MIMO) antenna systems rank among the emerging key technologies in next generation wireless communication systems. For the analysis of real antenna radiation characteristics and influences by mutual coupling in a multielement antenna arrangement, a spherical eigenmode (SME) evaluation of antenna radiation patterns is presented. In combination with a statistical description of the underlying channel model, the eigenmode expansion provides an efficient alternative to establish an analytical approach in the calculation of antenna envelope correlation and MIMO channel capacity.