Study of the Vector Channel Response Estimation for Antenna Array DS/CDMA System

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ABSTRACT

In this paper, we investigate the estimation algorithms of the vector channel impulse responses(VCIR) in uplink antenna array DS/CDMA communication under short (periodic) and long (aperiodic) spreading codes situation. The uplink channel can be modeled as a multiple signal-input-multiple-output (SIMO) system. When multipath fading is considered, we can group each path ’s VCIR (or composite spatial signature) corresponding to distinct direction-of-arrivals (DOAs) and the attenuation factor of the path into a composite VCIR. The basestation can extract each user ’s information by estimating the spatial signature of all signals. Though, classical algorithm (e.g.: maximum likelihood) can be applied for the estimation, however this method is computationally prohibitive. Based on the subspace concept, we propose a blind algorithm to estimate the spatial parameters without training sequence. In this algorithm, we can convert the multiuser multidimensional parameters ’ estimation problem into a set of signle user optimization problems. More specifically, simulation results demonstrate that the algorithm is near-far resistant.

Keywords : DS/CDMA ; VCIR ; MSIMO ; multipath fading ; spatial signature

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