CDMA系统中一种快速有效的盲波束形成方法

李佳靖, 金荣洪, 耿军平

(上海交通大学 电子工程系，上海 200240)

摘要　　利用DS-CDMA系统的工作原理，提出一种基于鲍威尔法的最大化阵列输出功率的盲波束形成方法．只需检测相关器解扩后输出信号移相合并的功率，即可求出用于搜索的共轭方向，自适应地调整阵列天线中各阵元的相位，使形成波束指向期望用户的来波方向．该方法降低了系统复杂度．数值仿真结果表明，鲍威尔法与类似优化算法相比，提高了波束形成的稳定性，减少了计算量，并在同等收敛精度下具有更优的方向图．单信号入射时本方法的迭代次数和乘法次数约为同类方法的10％，双信号入射时的计算量进一步减小至同类方法的2％．

关键词　　CDMA　智能天线　阵列输出功率　波束形成　鲍威尔法

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A fast and efficient bind beamforming method for CDMA systems

LI Jia-jing,JIN Rong-hong,GENG Jun-ping

(Department of Electronic Engineering, Shanghai Jiao Tong Univ., Shanghai 200240， China)

Abstract

A fast and efficient blind beamforming algorithm for DS-CDMA systems is presented. It utilizes the Powell algorithm to determine conjugate searching directions, so as to maximize the combined output of correlators and to form a beam toward the DOA of the desired user by shifting the phase of each element. It simplifies the beamforming system and simulation results show that the proposed algorithm enhances the stability of beamforming and immensely reduces the computational load compared with available methods in literature. Furthermore, it leads to a better beampattern with fewer requirements for the convergence criteria. The number of iterations and multiplications required by this method is approximately 10％ that required by the available methods when only one path is received and this will be further reduced to 2％ that when two paths exist.

Key words　CDMA　smart antennas　array output power　beamforming　Powell algorithm

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