

Abstract

Minimum Bit Error Rate Beamforming Combined with Space-Time Block Coding

In this paper, we propose a Minimum Bit Error Rate (MBER) beamforming combined with Space-Time Block Coding (STBC) according to the number of antenna array. A class of adaptive beamforming algorithm has been proposed based on minimizing the BER cost function directly. Consequently, MBER beamforming is capable of providing significant performance gains in terms of a reduced BER. The beamforming weights of the combined system are optimized in such a way that the virtual channel coefficients corresponding to STBC-encoded data streams, seen at the receiver, are guaranteed to be uncorrelated. Therefore the promised achievable diversity order by conventional system with STBC can be obtained completely. Combined MBER beamforming with STBC single array performance measured by BER is compared under the condition of direction of arrival (DOA) and signal-to-noise ratio (SNR). The numerical simulation results of the proposed technique show that this minimum BER (MBER) approach utilizes the antenna array elements more intelligently and have a performance dependent of DOA and angular spread (AS).