Algebraic Space Time Code Implementation in MIMO Environment: Design Criteria and Performance

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Abstract— **With their very Algebraic-construction based on Quaternionic algebra, Algebraic Space Time Codes (ASTC), called the Golden codes, have a full rate, full diversity and nonvanishing constant minimum determinant for increasing spectral efficiency. They have also uniform average transmitted energy per antenna and good shaping, readily lend themselves to high data rate situations. In this paper, we first analyze the performances of the ASTC codes in correlated Rayleigh channel. We consider a coherent demodulator using different decoding schemes and we analyze the Bit Error Rate (BER). In order to increase the spectral efficiency and to maximize the coding gain, ASTC have been proposed for MIMO flat fading channels. To deal with the frequency selectivity, we use the OFDM modulation. So we analyze the performances of an ASTCMIMO- OFDM system in terms of BER.**

Keyword—**ASTC code, OFDM, MIMO, Rayleigh Channel, Bit Error Rate**

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