Abstract

MIMO techniques play a key role in the current wireless specifications including IEEE 802.11n, IEEE 802.16e, and LTE. Indeed, spatial multiplexing (SM) and Alamouti code are already in use in WiMAX systems based on IEEE 802.16e specifications [1]. But more efficient full-diversity full-rate codes, such as Golden code (GC) [2], are still under discussion and have been proposed for future evolutions of the standards. However, the maximum likelihood (ML) or ML-like decoding of these codes is still not feasible for practical implementation. Existing papers include performance comparisons of such complex codes limited to simple scenarios and their performances in a real WiMAX environment have not been discussed in detail.

This final project design and simulate the performance of the SM and GC at 2 × 2 MIMO STC transmission that meets the specifications of Mobile WiMAX 802.16e standard. Analyses were performed to demonstrate the performance of the 2x2 MIMO STC WiMAX with finding Comparison between BER and Eb/No when encoded and not encoded. Modulation used is QPSK, 16 QAM and 64 QAM. At modulation, Convolutional Coding used in the coding rate 1/2 and 2/3.

From the simulation results of STC 2x2 MIMO system in Mobile WiMAX, GC superior when channel coding is not performed and low-level code rate while the superior SM at a high level code rate. GC's performance on QPSK shows the performance that has much difference with SM is the most shows BER $10^{-3}$ at Eb/No 12dB and 14dB for the GC. Advantages can also known when used MIMO-OFDM technique than just only used MIMO which looks Eb/No only 16dB for 16 QAM when used MIMO-OFDM and 19dB when used only MIMO.

Keywords: MIMO, STC, Golden Code
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