



**RESEARCH ARTICLE**

# Low Complexity Multiple Active Transmit Antenna For High Transmit Rate

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**Abstract**— *Wireless networks have quickly become part of everyday life. Wireless LANs, cell phone networks, and personal area networks are just a few examples of widely used wireless networks. However, wireless devices are range and data rate limited. A generalized spatial modulation (SM) scheme with multiple active transmit antennas, named as Multiple Active- Spatial Modulation (MA-SM), is alternative to the STBC system. It allows several antennas to be active simultaneously to achieve high transmit rate. In the MA-SM system, the transmitted symbols are mapped into a high dimensional constellation space including the spatial dimension. A general principle for designing the MA-SM code is to carefully designing over the antenna sets and the rotation angle applied to symbols, more diversity gains are available. Finally, these GSM techniques are implemented in MATLAB and analyzed for performance according to their bit-error rates using BPSK, QPSK, 8PSK, and 16-QAM modulation schemes. Simulation results shows that BPSK produce a reduced bit error rate. A closed form bound for the bit error probability (BEP) of the proposed detection scheme is also derived in this paper. Numerical results with the comparison among the existing multiple-input multiple output (MIMO) systems such as space time block code (STBC) and V-BLAST demonstrate the efficiency of MA-SM.*

**Key Terms:** - *Generalized Spatial modulation; Spatial modulation; vertical-Bell lab layered space-time; maximum likelihood detection; multiple-input multiple-output (MIMO) system*

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