# Performance Analysis And Iterative Decoding Of I-Q Trellis Space-Time Codes

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## Summary

I-Q trellis codes are known to increase the time diversity of coded systems. When I-Q codes are used with multiple transmit antennas, the decoding and performance evaluation requires the construction of the high-complexity super-trellis of the component codes. In the paper, the bit error probability and the design criteria of I-Q ST codes are derived using the transfer functions of the component codes. Conditions for the geometrical uniformity of I-Q space-time (ST) codes are derived from the geometrical uniformity of the component codes. In addition, a low-complexity iterative receiver for I-Q ST codes is presented. The receiver essentially performs iterative detection and decoding. Results show that three iterations of the iterative receiver performs very close to the optimal decoding.