Diversity gain of DQPSK-OFDM system

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Block diagram of OFDM system with 2-branch MRC diversity reception
SNR Improvement of Each Subcarrier by Diversity Combining

![Diagram showing SNR Improvement through Diversity Combining]

- Fading Envelope
- Each subcarrier
- Branch-1
- Branch-2
- Diversity Combining
- Combined signals
Packet Error Rate in Multipath Propagation with AWGN

(DQPSK-OFDM Information data rate = 15 Mbit/s, Coding rate = 3/4)

Packet Error Rate versus $Eb/N0$
Diversity Gain in Multipath Propagation with AWGN

(DQPSK-OFDM Information data rate = 15 Mbit/s, Coding rate = 3/4)

- 2-branch maximal ratio combining diversity
- PER = 10^-1
- through non-linear channel: OBO = 5 dB
- Packet length = 1000 byte
- with ideal AGC
- 3 bit soft decision
- $t_{RMS} = 100$ ns

Diversity Gain versus Correlation Factor
Packet Error Rate in Multipath Propagation with AWGN

(DQPSK-OFDM Information data rate = 15 Mbit/s, Coding rate = 3/4)

- Packet length = 1000 byte
- 3 bit soft decision
- with ideal AGC
- through non-linear channel: OBO = 5 dB
- 2-branch maximal ratio combining diversity
- Correlation factor = 0.6
- without Diversity
- $E_b/N_0$ (dB)

Packet Error Rate versus $E_b/N_0$
Conclusion

More than 8 dB diversity gain is obtained when 2-branch MRC diversity reception of the DQPSK-OFDM system is employed in practical environment.