

Conclusion

The single user detector is the simplest detector in implementation. And if the amplitude of interference is sufficiently small, the BER performance is better than that of the decorrelating detector.

There is some loss in BER because it is not sufficient statistic in detection and it is not near-far resistance.

That is, BER does not go to zero as even the background noise go to zero if the amplitude of interference is increased.

The optimum detector has the best performance in BER and near-far resistance. But it is very complex in implementation (for example, brute-force, even we use the Viterbi Algorithm).

The decorrelation detector has a little loss in BER performance but can achieve big advantage in implement and near-far resistance, comparing the optimum detector.

- It does not require knowledge of the received amplitudes.
- The demodulation of each user can be implemented completely independently.

The optimal linear detector improves the asymptotic multiuser efficiency by combining the decorrelating detector and optimum detector.
