# A Linear Group Polynomial-Expansion Successive Interference Cancellation Detector

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## Summary

In this work, we consider a linear group polynomial expansion successive interference cancellation (GPE-SIC) detector in a synchronous CDMA system. It is a hybrid detector, which combines parallel and successive cancellation techniques in order to extract the advantages of both of the schemes. Benefiting from the fact that even if the cross-correlation matrix of the system is not diagonal-dominant, we can force the cross-correlation matrix of users within the same group to be diagonal-dominant by suitable grouping and approximate the decorrelator/MMSE detector by a low-complexity polynomial expansion detector. This approximation is very accurate if the cross-correlation matrix of users within the same group is diagonal-dominant. Simulation results showed that the (GPE-SIC) detector has the same performance as the linear group decorrelator successive interference cancellation (GDEC-SIC) detector but with lower computational complexity.