

# **Abstract**

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## **Optimal Design for Channel Equalization Via Filterbank Approach**

Channel equalization is investigated via the filter bank approach. A necessary and sufficient condition is established for perfect reconstruction (PR) of the transmitter-receiver filterbanks. If the PR condition holds, then all causal and stable receiver filterbanks which achieve PR are parameterized. It is further shown that the receiver filterbank for optimal channel equalization has the form of state estimator, and is a modified Kalman filter. The design algorithm for optimal channel equalizers is developed. A simulation example is worked out to illustrate the proposed design algorithm.