

An Adaptive IIR Equalizer for Nonminimum Phase Channels

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Abstract

An adaptive IIR equalization method is presented for nonminimum phase communication channels. Few IIR adaptive filters have been used as adaptive equalizers due to lack of guaranteed stability. For assurance of the stability of an IIR equalizer, we separate the minimum phase part from the nonminimum phase channel through iterative FIR equalization and system identification of the equalized channel. The impulse response of the equalized channel becomes a minimum phase sequence with almost zero energy on its anticausal part. Then The Routh-Hurwitz criterion is introduced to check the stability of the equalized channel response every iteration. Simulation results show that we can obtain a minimum phase response after just a few iterations. So, it is possible to directly invert the impulse response of the equalized channel with guaranteed stability. For the same number of filter taps, the proposed method has much better performance than conventional transversal equalizers.