DHT−BASED FREQUENCY−DOMAIN EQUALIZER FOR DMT SYSTEMS (TueAmOR7)

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Abstract :

A DHT−based frequency−domain equalizer (FEQ) is presented to eliminate the real−to−complex transformation (R2CT) for the discrete Hartley transform (DHT) based discrete multi−tone (DMT) systems. The DHT−based FEQ can be further used to develop the DHT−based per−tone equalization for DMT systems. In this paper, the DHT−based DMT ADSL system is adopted as a vehicle to demonstrate the DHT−based FEQ performance. Based on the steepest descent (SD) algorithm, the DHT−based FEQ is derived without employing R2CT, which costs 2N−addition. N is the number of DHT points. The performance analysis of the DHT−based FEQ proves no signal−to−noise ratio (SNR) loss compared with the DFT−based FEQ, and the bit allocation and data rate are identical with the performance analysis.

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