CLIPPING ERROR RESILIENCE FOR PEAK POWER-CONSTRAINED DMT TRANSMISSION VIA IMPLICIT FREQUENCY DOMAIN REDUNDANCY

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ABSTRACT

In this paper we present a new error correction approach for a simple peak-to-average power ratio (PAR) reduction scheme for discrete multi-tone (DMT) systems based on coefficient clipping. The proposed method utilizes existing or intentionally placed redundancy in the frequency domain in form of unused subcarriers. Compared to existing PAR reduction algorithms, all signal processing is performed at the receiver after the transmit signal has been simply clipped to a desired maximum amplitude at the front end of the transmitter. The introduced frequencydomain redundancy allows to consider each output vector of the IDFT in the DMT transmitter as codeword of a BoseChaudhuri-Hocquenghem (BCH) block code over the field of real numbers. The decoding operation is carried out by a low-complexity linear reconstruction. Simulation results for noisy transmission show that by using the proposed method clipping does not lead to significant errors in the received data if a reasonable amount of redundancy is provided.