

Efficient Single Carrier Modulation with Frequency Domain Equalization over Multipath Wireless Channel with Narrowband Interference

Abstract—Orthogonal Frequency Division Multiplexing (OFDM) has the inherent problem of high peak to average power ratio (PAPR). Moreover, it suffers from high sensitivity to frequency offsets. In comparison to OFDM, Single Carrier Modulation (SCM) coupled with frequency domain equalization (FDE) offers a comparable performance and complexity while avoiding the drawbacks of high PAPR and frequency offset sensitivity, associated with multicarrier modulation. This paper presents a performance comparison between OFDM and SCM with FDE over multipath wireless channel with narrowband interference (NBI). SCM utilizes minimum mean square error (MMSE) algorithm for the training of the frequency domain equalizer. It is shown that SCM employing a frequency domain MMSE equalizer exhibits higher immunity to NBI as compared to an OFDM system, over multipath wireless channel.