Abstract

In this paper, we study the performance of the Digital Video Broadcasting- Terrestrial (DVB-T) system with Continuous Phase Modulation Orthogonal Frequency Division Multiplexing (CPM-OFDM). The proposed structure combines the advantage of mitigating the Peak-to-Average Power Ratio (PAPR) problem in the Power Amplifier (PA) in addition to exploiting the channel frequency diversity and power efficiency of CPM. The proposed CPM-OFDM DVB-T system is implemented with Frequency-Domain Equalization (FDE) to
Continuous Phase Modulation for Digital Video Broadcasting

avoid the complexity of the equalization. Two types of frequency domain equalizers are
considered and compared for performance evaluation of the system; the Zero-Forcing (ZF)
equalizer and the Minimum Mean Square Error (MMSE) equalizer. Simulation results show that
the performance of the CPM-OFDM DVB-T system with multi-path fading is better than its
performance with single-path fading.

References

- W. Fischer, "Digital video and audio broadcasting technology", A Practical
- R. V. Nee and R. Prasad, "OFDM for wireless multimedia communications",
- H. Schulze and C. Luders, "Theory and application of OFDM and CDMA
- P. Banelli, "Theoretical analysis and performance of OFDM signals in nonlinear
- D. Dardari, V. Tralli and A Vaccari, "A theoretical characterization of nonlinear
distortion effects in OFDM systems", IEEE Transactions on Communications 2000,
48(10):1755–1764.
- P. Banelli, G. Baruffa, S. Cacopardi. "Effects of HPA non linearity on frequency
- S. Han, J. Lee, "An overview of peak-to-average power ratio reduction techniques
  for multicarrier transmission", IEEE Transactions on Wireless Communications 2005,
- Y. Lee, Y. You, W. Jeon, J. Paik and H. Song, "Peak-to-average power ratio in
  MIMO-OFDM systems using selective mapping", IEEE Communications Letters 2003,
7:575–577.
- E. S. Hassan, S. E. El-Khamy, M. I. Dessouky, S. A. El-Dolil and F. E. Abd El-Samie,
  "Peak-to-average power ratio reduction in space–time block coded multi-input multi-output
  orthogonal frequency division multiplexing systems using a small overhead selective mapping
- H. Chen, H. Liang, "Combined selective mapping and binary cyclic codes for
  PAPR reduction in OFDM systems", IEEE Transactions on Wireless Communications
- E. S. Hassan, S. E. El-Khamy, M. I. Dessouky, S. A. El-Dolil and F. E. Abd El-Samie,
  "A simple selective mapping algorithm for the peak to average power ratio in space time
  block coded MIMO-OFDM systems", Proceedings of HPCNCS-08, Orlando, FL, U. S. A.,
- S. Sengar, P. P. Bhattacharya, "Performance improvement in OFDM system by
  PAPR reduction", International Journal of Computer Networks &
Communications(IJCNN), April 2012.
- G. Sikri, Rajni, "A comparison of different PAPR reduction techniques in OFDM
  using various modulations", International Journal of Computer Networks &
Communications(IJCNC), August 2012.


Index Terms

Computer Science  Image Processing

Keywords

DVB-T  OFDM  CPM  ZF Equalizer  MMSE Equalizer  PAPR.