

Research on PAPR Reduction of OFDM Signals Using Carrier Interferometry Codes and Iterative Processing: Low Complexity and Applicable Design

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The success of peak-to-average power ratio (PAPR) reduction of OFDM signals using carrier interferometry (CI) combined with iterative processing (IP) or simply called CI/IP as presented in [1] and Fig. 1 led me to improve the performance of OFDM without BER degradation and low complexity.

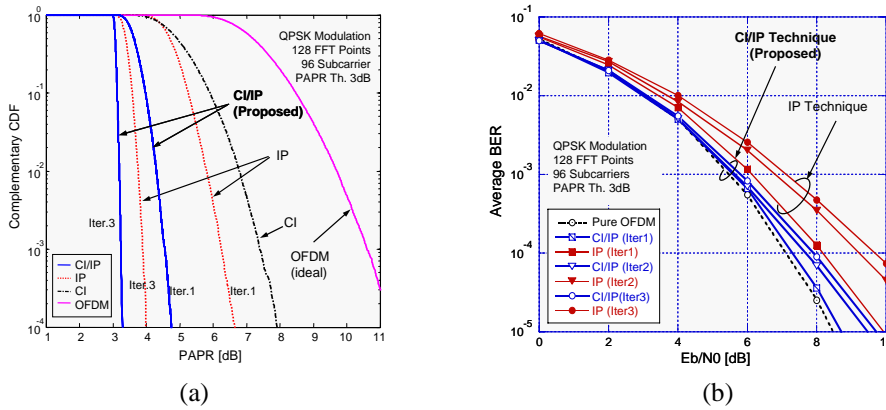


Fig. 1 (a). PAPR performance with the proposed CI/IP technique, (b). BER performance with the proposed CI/IP

© Khoirul Anwar, "PAPR Reduction of OFDM Signals Using CI Codes and IP", A Master Thesis of NAIST, March 2005.

We proposed a simplified design of Carrier Interferometry OFDM (CI/OFDM) which has 3 advantages: (a) PAPR Reductions, (b) Frequency Diversity, (c) Complexity Reduction, as presented in [2]-[4] and Fig. 2. In [5]-[7], we did a further improvement and complexity reduction for the clipping-filtering and MMSE combiner of CI/OFDM

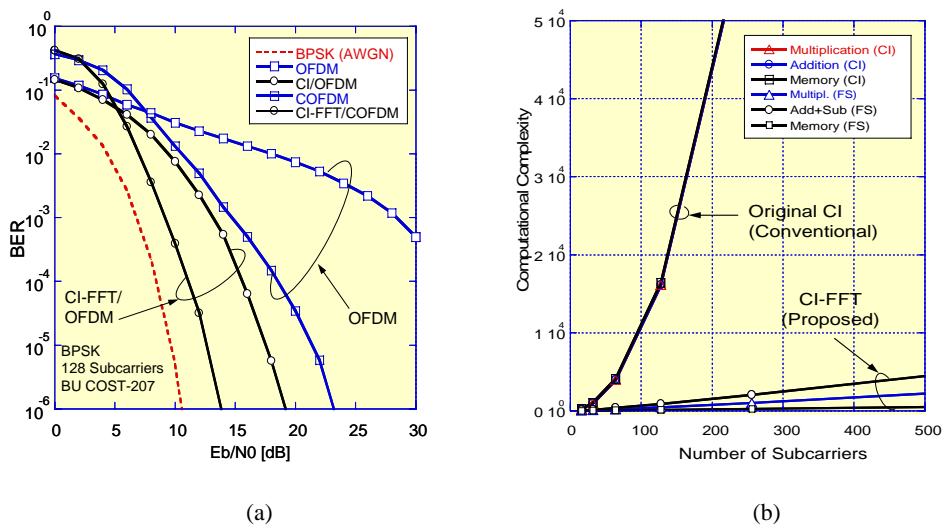
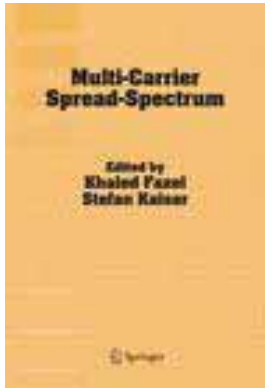


Fig. 2 (a) BER performance in COST-207 Fading model, (b) Significant complexity reduction by CI-FFT

© K. Anwar and H. Yamamoto, "A New Design of CI/OFDM ...", IEEE RWS2006, San Diego, CA, in [3]

Results (also as References)

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[2]. K. Anwar, M. Saito, T. Hara, M. Okada and H. Yamamoto, "Simplified Realization of Pseudo-Orthogonal Carrier Interferometry OFDM by FFT Algorithm", 5th IEEE Multi-Carrier Spread Spectrum (MC-SS 2005), Oberpfaffenhofen, Munich, Germany, September 14-16, 2005 (appear in Multi-Carrier Spread-Spectrum Proceedings from the 5th International Workshop, Oberpfaffenhofen, Germany, September 14-16, 2005 Fazel, Khaled; Kaiser, Stefan (Eds.) 2006, XVII, 502 p., Hardcover ISBN: 1-4020-4435-6).



[3]. Khoirul Anwar and Heiichi Yamamoto, "A New Design of Carrier Interferometry OFDM with FFT as Spreading Codes", IEEE Radio and Wireless Symposium (RWS 2006), San Diego, California, January 17-19, 2006. [**Best Student Paper**]

Best student paper award, IEEE RWS2006, San Diego, California, 14-19 January 2006.

[4]. K. Anwar, M. Saito, T. Hara, M. Okada and H. Yamamoto, "Simplified Realization of Carrier Interferometry OFDM by FFT Algorithm", 2nd IEEE VTS Asia Pacific Wireless Communications System (APWCS 2005), Hokkaido, Japan, August 4-5, 2005, pp. 199-203.

[5]. H. Okamoto, K. Anwar, M. Saito, T. Hara, M. Okada and H. Yamamoto, "PAPR Reduction of OFDM Signals Using Clipping and Carrier Interferometry Codes", 2nd IEEE VTS Asia Pacific Wireless Communications System (APWCS 2005), Hokkaido, Japan, August 4-5, 2005, pp. 164-168.

[6]. K. Anwar, T. Hara, M. Saito, M. Okada and H. Yamamoto, "A Novel Fast Computation without Division for MMSE Equalizer and Combiner", IEEE Industrial, Electrical and Electronic GCC, Manama, Bahrain, March, 2006.

[7]. H. Okamoto, K. Anwar, T. Hara, M. Saito, M. Okada and H. Yamamoto, "A New Concept of Clipping without Spectrum broadening for Carrier Interferometry OFDM system", IEEE Industrial, Electrical and Electronic GCC, Manama, Bahrain, March, 2006.