Editorial

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Multicarrier (MC) transmission, especially, orthogonal frequency division multiplexing (OFDM), has recently attracted considerable attention since it has been shown to be an effective technique to combat delay spread or frequency-selective fading of wireless or wireline channels. This approach has been adopted in standards for several outdoor and indoor high-speed wireless and wireline data applications, including wireless local area networks, digital audio and video broadcasting, and digital subscriber line modems. MC transmission requires no equalizers, which makes it possible to combine with many advanced techniques to improve the capacity and enhance the performance of transmission. At the same time, many issues in MC communications, such as time- and frequency-offset estimation and correction, channel estimation, and peak-to-average power ratio (PAPR) reduction, need to be solved. This special issue includes 15 papers that address all of these issues.

Channel estimation and (one-tap) equalization are very important for signal detection of MC or OFDM. The first five papers are on this topic. The papers by G. Ysebaert et al. and by T. Karp et al. investigate one-tap or per-tone equalization in DMT. The paper by X. Ma et al. applies EM algorithms in channel estimation of OFDM-based wireless communication systems. The paper by N. Wang and S. D. Blostein develops adaptive zero-padding approaches for bandwidth efficient OFDM. The paper by J. Xu et al. compares the complexity and the performance of multiple-input multiple-output (MIMO) OFDM and single-carrier systems with frequency-domain equalization (SC-FDE). The PAPR problem is dealt with in the paper by N. Andgart et al., where per-tone reservation is used to reduce the PARP of OFDM (or DMT) systems.

There are five papers that investigate signal detection and coding in OFDM or DMT systems. The paper by K. F. Lee and D. B. Williams proposes iterative space-time and space-frequency block-coded OFDM with transmit antenna arrays. The paper by R. Cendrillon et al. deals with partial crosstalk cancellation in DMT-based very-high-data-rate digital subscribe line (VDSL) systems. The papers by A. Ishii et al. and by V. Mannoni et al. study differential detection and LDPC code for OFDM systems, respectively. The paper by D. Dardari et al. studies adaptive modulation and bit loading for OFDM-based video transmission systems.

MC can be used together with code-division multiple access (CDMA) to form MC-CDMA and get their advantages. There are four papers in this topic. The paper by F. Petré et al. studies MC-based block-spread CDMA for broadband cellular systems. The papers by Z. Li and M. Latva-aho and by K. Zhang and Y. L. Guan analyze the performance of MC-CDMA systems. The paper by S. Le Nours et al. investigates implementation issues of MC-CDMA.

Again, we would like to thank the authors for their submissions and the reviewers for their high-quality reviews.

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