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NOVEL SYNCHRONIZATION PROCESS FOR MULTI-CARRIER OR SINGLE-CARRIER COMMUNICATIONS

Patent
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Code

TIC_UAH_21

Application areas

- Information and Communication Technologies



Type of Collaboration

- Technical cooperation
- Commercial Agreement
- Commercial agreement and Technical assistance
- License agreement

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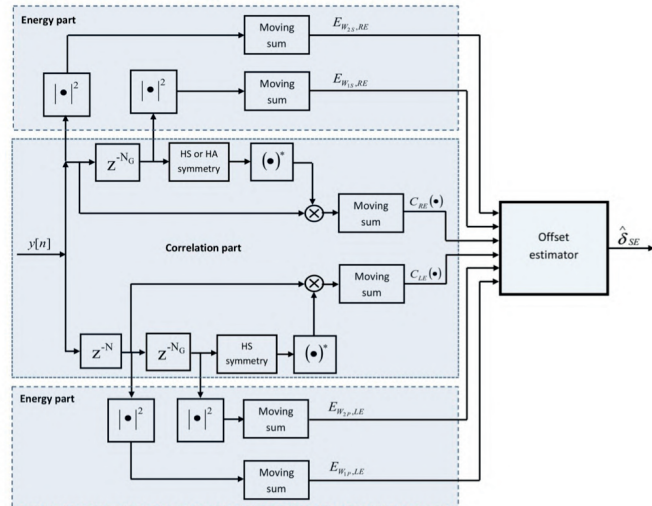
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ABSTRACT

This invention presents a novel synchronization procedure for multicarrier or single carrier systems for narrowband and broadband communications. This procedure allows a precise estimation of the Symbol Timing Offset (STO), and an approximation of the carrier frequency offset. The procedure is based on the inclusion of symmetric extensions in the transmitted symbols for the synchronization, which makes it useful not only for communications systems based on the discrete Fourier transform (OFDM and windowed OFDM), but also for transceivers based on discrete cosine transform (FAST-OFDM).

Among its main applications are communications through single-mode optical fiber, power network, wireless, and in general, all the techniques that use multicarrier and carrier modulation.

ADVANTAGES AND INNOVATIONS

In any multicarrier or single carrier modulation system, symbol timing estimators play an important role in the receiver to find the start of the symbol of the received signal. The invention proposes a method for synchronization in a multi-carrier or single carrier modulation point-to-point or multipoint transmission system, in which the symbols transmitted to the other equipment have symmetrical extension. The new technique is based on the fact that the correlation between two signals provides a quantitative measure of their similarity.

The proposed technique perform well, especially in low dispersive channels. It is proven that considering the BER and the probability of the estimate error in the time offset, a performance gain over conventional techniques is obtained when the length of the redundancy increases.