

## **Joint channel and carrier frequency offset estimation for UFMC**

Abstract—Many efforts are currently undertaken for the definition of enhanced multicarrier waveforms (post 4G LTE). These waveforms relax the time domain localization to impose well localized spectrum shape. UFMC is considered as one of the most serious candidate for the 5th Generation of wireless communication systems, which aims at replacing OFDM and enhances system robustness and performance in relaxed synchronization condition e.g. time-frequency misalignment. An extensive literature has shown the advantages of UFMC with respect to OFDM for these new requirements of 5G, however joint channel and CFO estimation for UFMC has not been investigated yet. This is the topic of this paper. We proposed an algorithm based on expectation-maximization to jointly estimate the channel impulse response and the CFO that occurs due to frequency mismatch between the oscillators at the receiver and at the transmitter.

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