

Performance Analysis of 5G for Low Latency Transmission Based on Universal Filtered Multi-Carrier Technique and Interleave Division Multiple Access

Authors : A. Asgharzadeh, M. Maroufi

Abstract : 5G mobile communication system has drawn more and more attention. The 5G system needs to provide three different types of services, including enhanced Mobile BroadBand (eMBB), massive machine-type communication (mMTC), and ultra-reliable and low-latency communication (URLLC). Universal Filtered Multi-Carrier (UFMC), Filter Bank Multicarrier (FBMC), and Filtered Orthogonal Frequency Division Multiplexing (f-OFDM) are suggested as a well-known candidate waveform for the coming 5G system. The machine-to-machine (M2M) communications are one of the essential applications in 5G, and it involves exchanging of concise messages with a very short latency. However, in UFMC systems, the subcarriers are grouped into subbands but f-OFDM only one subband covers the entire band. Furthermore, in FBMC, a subband includes only one subcarrier, and the number of subbands is the same as the number of subcarriers. This paper mainly discusses the performance of UFMC with different parameters for the UFMC system. Also, paper shows that UFMC is the best choice outperforming OFDM in any case and FBMC in case of very short packets while performing similarly for long sequences with channel estimation techniques for Interleave Division Multiple Access (IDMA) systems.

Keywords : universal filtered multi-carrier technique, UFMC, interleave division multiple access, IDMA, fifth-generation, subband

Conference Title : ICBTT 2020 : International Conference on Broadband Technologies and Telecommunication

Conference Location : Barcelona, Spain

Conference Dates : May 22-23, 2020