

In this paper, a multiuser OFDM-based chaos shift keying (MU OFDM-DCSK) modulation is presented. In this system, the spreading operation is performed in time domain over the multicarrier frequencies. To allow the multiple access scenario without using excessive bandwidth, each user has N_p predefined private frequencies from the N available frequencies to transmit its reference signal and share with the other users the remaining frequencies to transmit its M spread bits. In this new design, N_p duplicated chaotic reference signals are used to transmit M bits instead of using M different chaotic reference signals as done in DCSK systems. Moreover, given that $N_p \ll M$, the MU OFDMDCSK scheme increases spectral efficiency, uses less energy and allows multiple-access scenario. Therefore, the use of OFDM technique reduces the integration complexity of the system where the parallel low pass filters are no longer needed to recover the transmitted data as in multicarrier DCSK scheme. Finally, the bit error rate performance is investigated under multipath Rayleigh fading channels, in the presence of multiuser and additive white Gaussian noise interferences. Simulation results confirm the accuracy of our analysis and show the advantages of this new hybrid design