ABSTRACT

Orthogonal Frequency Division Multiplexing (OFDM) is multicarrier modulation technique which has been applied for wired and wireless communication systems due to its high data rate transmission capability with high bandwidth efficiency compared FDM technology. But OFDM is sensitive to attenuation orthogonality of subcarrier which cause by frequency offset and Intercarrier Interference(ICI) is present. Its causes by Doppler Shift and mismatch oscillator between transmitter and receiver. So , the reduction of ICI is needed to performance enhancement of OFDM system and the proposed method is using pulse shaping.

In the OFDM spectrum each subcarrier consists of a main lobe and followed by a number of side lobes. When orthogonality lost, the side lobes cause ICI. The purpose of pulse shaping is to reduce the side lobe ,as the side lobes contains the ICI power. In the simulation will compare the rectangular pulse as the conventional and pulse shaping with the Improved Sinc Power Pulse(ISP) in mobile Wimax system.

The result of simulation shows that using pulse shaping with ISP pulse make the better performance of OFDM when frequency offset is present which its show by the Bit Error Rate(BER) to Eb/No. It provide improvements range ±2 dB to over 6 dB for a target BER 10^{-4}. And then, when the value of Eb/No used 15 dB performance achieved BER 10^{-4}.

Keywords: OFDM, ICI, BER, ISP, pulse shaping, frequency offset