**USING CHAOTIC SEQUENCE IN DIRECT SEQUENCE SPREAD SPECTRUM BASED ON CODE DIVISION MULTIPLE ACCESS (DS-CDMA)**

**ABSTRACT**

The paper aim was an investigation on use of chaotic sequence in DS-CDMA. The DS-CDMA systems offer physical layer security without the need for a significant increase in computation or power requirements. Nowadays, DSCDMA has been used widely. These systems suffers from multiple access interference because of other users transmitting in the cell, channel inter symbol interference and additive white Gaussian noise. Codes have an effective role in DSCDMA system, so M-sequences; gold sequences have been used as spreading codes in DS-CDMA. These sequences by shift registers and periodic in nature are developed. However, these sequences are not enough and also limit the security. This paper presents an investigation on use of new type of sequences called chaotic sequences for DS-CDMA system. These sequences by chaotic maps are generated. First of all, chaotic sequences are easy to generate and store. For very long sequences there are needed only a few parameters and functions. Moreover, numerous numbers of sequences can be developed simply by changing its initial condition. Chaotic sequences are deterministic, reproducible, uncorrelated and random-like, which can be very helpful in enhancing the security of transmission in communication. This paper examines the use of chaotic sequences in DS-CDMA systems using various receiver techniques. Extensive simulation indicate the performance of the different linear and nonlinear DS-CDMA receivers like RAKE receiver, matched filter (MF) receiver, minimum mean square error receiver and Volterra receiver using chaotic sequences and gold sequences.

***Keywords:*** chaotic sequence, direct sequence, spread spectrum, code division multiple access.