## INCREASE IN CAPACITY BY GENERATION OF WIDE - GOLD CODE SEQUENCE

## M. VIJAYARAJ AND K. SANKARANARAYANAN

## Abstract

As the demand for wireless service increases in number of channels assigned to a cell eventually becomes insufficient to support the required number of users. Capacity of a radio system is the maximum number of users that can be provided in a fixed frequency band. The capacity of FDMA and TDMA are bandwidth limited but the capacity of CDMA system is interference limited. In CDMA system each user is assigned a distinct quasi - orthogonal pseudo-noise sequence (PN Sequence) for accessing spread channel. CDMA can reuse the entire spectrum for all cells and this result in an increase of capacity by a large percentage for the normal frequency reuse factor. Analog system (FDMA) supports one user/ channel. GSM(Global System Mobile -Digital) system support **eight user/ channel** for **200KHz** radio channel and CDMA system supports more number users/channel that depends on the length of the sequence, that are orthogonally coded and simultaneously transmitted on each 1.25MHz channel. The use of spread spectrum communication techniques such as direct sequence-code division multiple access (DS-CDMA) has received increased attention over the past decade due to its advantages for providing enhanced multiple access capacity in mobile communication systems. An essential component in these spread spectrum communication system is pseudorandom or pseudo noise (PN) sequences which are used at the transmitter to generate the wide band transmitted signal and at the receiver to recover the narrowband message. The performance of DS-CDMA systems relies heavily on the quality of the signal isolation between many users sharing the same frequency band. In the presence of many interference users, good signal isolation can be established by assigning different PN sequences with nearly orthogonal properties to each user. Conventional PN sequences generated by linear feedback shift registers(LFSRs). However, the number of such sequences generated by LFSRs may be insufficient for wideband DS-CDMA systems with a very large number of users.

In this paper **Wild Gold-code sequences** were generated and its BER is compared with conventional CDMA in the AWGN channel.BER versus Eb/No for BPSK were plotted using MAT LAB. In this simulation model, two series combination of PN sequence generators were connected in parallel. The generator polynomials assigned in vector format in all the PN sequence generators were same and the initial state of the PN sequence generators were different .By the generation of the **Wide Gold Code Sequence** very large number of user can be accommodated than the conventional DS-CDMA system.