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An Efficient Pattern Spreading in CHMA System

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ABSTRACT: Code-hopping multiple access (CHMA) isatechnique in which the spreading code changes from one code to another. CHMAsystems are proposed for anti-interception. The perfect orthogonal complementary (POC) codeshelp to improve the performance of a CHMA system. POC characterize multiple access interference (MAI)-free and multipath interference (MI)-free operation.Data is transmitted by modulating it with the Perfect Orthogonal hopping codes. In the channel noise is added and with the same hopping code demodulation is achieved and original data is recovered. CHMA system isconvenient to build the big-area networks.The bit error rate(BER) is the key component consider for performance evaluation. The BER of a complementary-coded CHMA system with channel coding has less than traditional CHMA using Walsh codes.

Keywords: Code-hopping multiple access, Multipath interference, multiple-access interference, Bit error rate.

I. INTRODUCTION

Wireless communications are rapidly becoming more and more necessary for everyday activities. With so many more users to accommodate, more efficient use of bandwidth is a priority among system operators. Equally important is the security and reliability. One solution that has been offered is a Code Hopping Multiple Access System. It is a form of spread-spectrum, an advanced digital wireless transmission technique. Instead of using frequencies or time slots, as do traditional technologies, it uses mathematical codes to transmit and distinguish between multiple wireless conversations. Its bandwidth is much wider than that required for simple point-to-point communications at the same data rate because it uses noise-like carrier waves to spread the information.Two types of collisions normally occur in CHMA system one is constructive collision and the other one is destructive collision Orthogonal Complementary Codes is used in CHMA system. Because Orthogonal Complementary Code is to avoid collision between two spreaded data.

II. RELATEDWORK

CHMA stands for "Code Hopping Multiple Access." It is a form of spread-spectrum, an advanced digital wireless transmission technique. Instead of using frequencies or time slots, as do traditional technologies, it uses mathematical codes to transmit and distinguish between multiple wireless conversations. Its bandwidth is much wider than that required for simple point-to-point communications at the same data rate because it uses noise-like carrier waves to spread the information contained in a signal of interest over a much greater bandwidth. In[1] For orthogonal downlink and statistical In[5]multiplexing, three modes of orthogonal code hopping multiplexing (OCHM) are proposed to accommodate more orthogonal downlink channels than orthogonal code-words for downlink channels, and they are compared. It is a low performance method. In[2]Two important facts will be revealed by the analysis given in this paper. First, implementation of an interference-free CDMA will never be possible unless using complementary code sets, such as the PC code sets generated in this paper.Second, to enable the interference-free CDMA operation. It provides high complexity. In [3] the paper effort to construct Multicarrier CDMA architecture based on orthogonal complementary codes, characterized by its unique spreading modulation scheme, uplink and downlink signature design, and receiver implementation for multipath signal detection. In this paper number of different

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levels generated from the baseband could be a problem. In[4]obtain the optimal code rate in several traffic load environments by simulation and summarize the appropriate traffic load region for each code rate as the optimal code rate. An adaptive code rate control scheme is proposed and the base station adaptively changes the code rate according to traffic environments in order to save power, it is a high cost method. In [5]orthogonal code hopping multiple access (OCHMA) scheme in order to improve the capacity of an uplink-synchronized code division multiple access (CDMA) systems, it is a low performance method.

III PROPOSED SYSTEM

The main objective is to improve the performance of the CHMA system. By reduce the bit error rate we improve the performance of the CHMA system.Exploiting their ideal orthogonality, we apply orthogonal complementary codes to CHMA systems. In particular, we will show that the application of orthogonal complementary codes can significantly improve the performance of a CHMA system due to its unique collision-resistant capability. Collision is an important disadvantage in CHMA. To avoid collision between two spreaded data, the spreading codes should be an orthogonal complementary code. Any two complementary set of sequence are said to be orthogonal complementary set if they are mate of each other. To deal with destructive collisions among spreading codes in CHMA systems, convolutional coding is employed in complementary-coded CHMA systems. The bit error rate of the proposed system and traditional CHMA system using walsh codes are analyzed. The bit error rate of the proposed system is less.

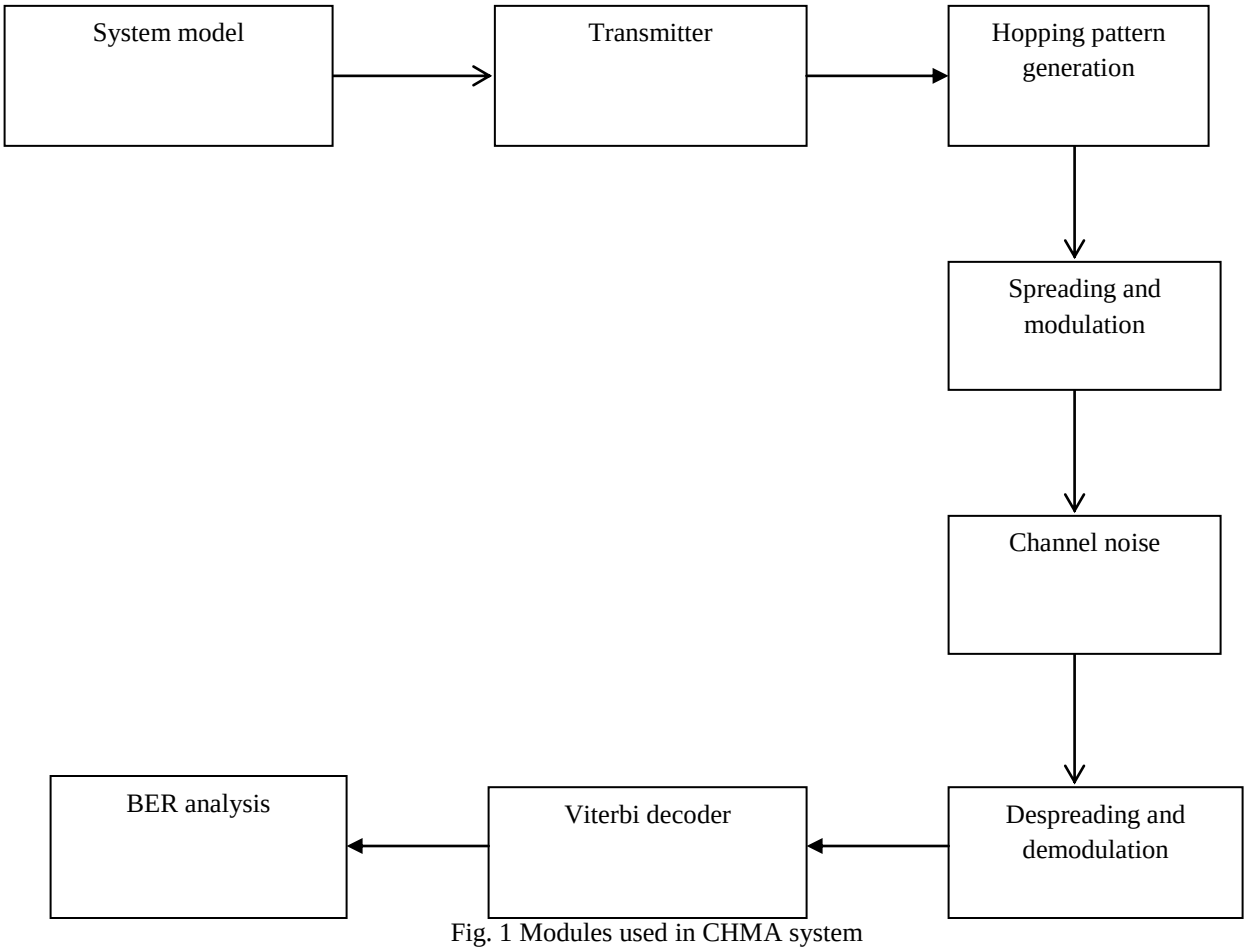

Fig. 1 Modules used in CHMA system

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IV. MODULEDESCRIPTION

System model: In a system model for each user which is able to generate a sequence of particular hopping patterns pertaining to a specific user based on generic complementary-coded CHMA system.

Hopping Pattern Generation: In CHMA the signature code hops from one code to another according to a specific Hopping pattern which is generated by a Hopping pattern generator which is normally the base station. It should be unique to each user. The Hopping pattern generation is based on Mobile Station Identifier.such as the electronic serial number.

Spreading and Modulation: Spreading modulator applied in transmitter side. Number of complementary codes and the number of user used in spreading and modulation. The spreading code used is orthogonal complementary code works on a flock of code rather than a single code. The purpose of communication system is to deliver a message signal from an information source in recognizable from to auser destination, with the source and the user being physically separated from each other. To do this the transmitter modifies the message signal into a form suitable for transmission over the channel. This modification involves some parameter of a carrier wave accordance with the message signal.

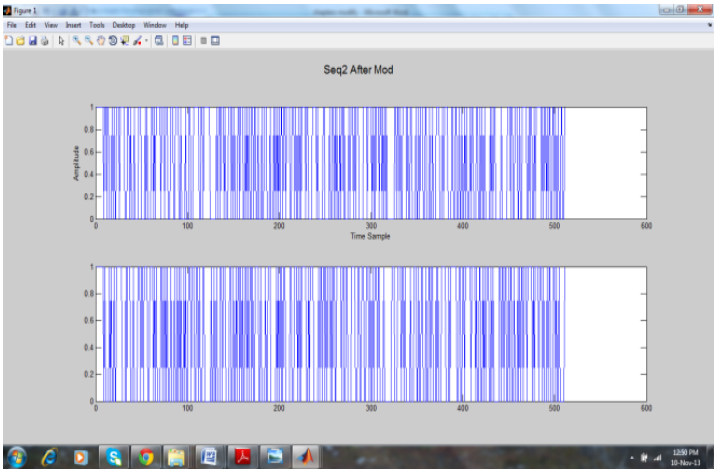

Fig. 2 Modulated Sequence Waveform

Despreading: Despreading modulator applied in receiver side. The process of despreding intends to retrieve the spreaded signal. This process uses the same spreading code as used in the transmitter. The autocorrelation function of an orthogonal complementary code is zero for any shift except zero shift and the cross correlation for a pair of orthogonal complementary codes is zero for all possible shifts.

Viterbi decoder: A viterbi decoder uses its input to compute estimates of the original multi bit sub channel data supplied to the transmitter. The viterbi decoder follows viterbi algorithm. The viterbi algorithm is based on maximum likelihood function.Viterbi decoder function is given byLog p(r/c) = d log (p/ (1-p)) + N log (1-p)BER Analysis: The performance of the system is analyzed using Bit Error Rate. Proposed method for the Bit error rate is analyzed, based on with channel coding and compared with the Walsh code CHMA method.

VRESULT

BER in a complementary-coded CHMA system with channel coding is much better than that in a Walsh-coded CHMA system. Bit error rate obtained by proposed work using orthogonal sequence has less bit error rate. The proposed method is implemented using Matlab. The bit error rate of the received signal is obtained by the sum of all the user data in the system. So the proposed method avoid multiple access interference and multipath interference.

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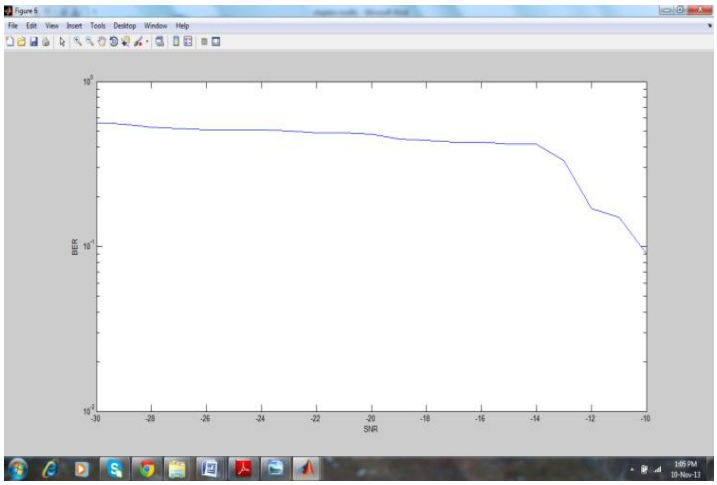

Fig. 3 Bit Error Rate with channel coding

The performance of the system is analyzed using Bit Error Rate. Proposed method for the Bit error rate is analyzed, based on with channel coding and compared with the Walsh code CHMA method.

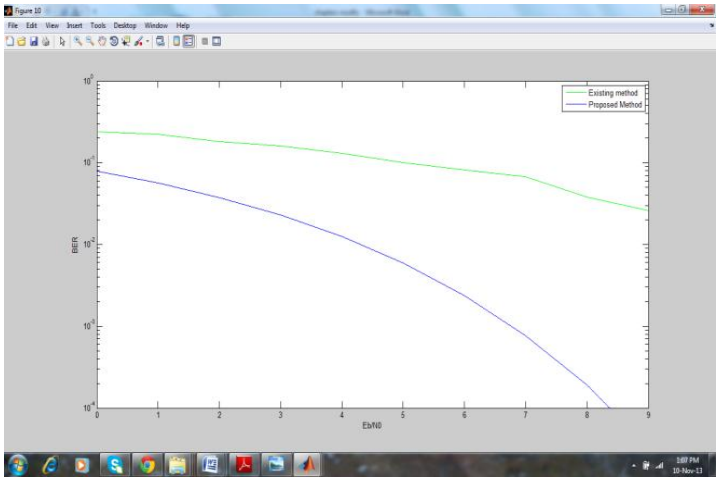

Fig. 4 Bit Error Rate Comparison

VI CONCLUSION

The Orthogonal Code Hopping Multiplexing with Orthogonal Complementary Codes can support more channels than the number of orthogonal code due to the flock of codes being used. The orthogonal codes used in CHMA systems to enhance the performance of CHMA system. Due to the ideal correlation property of the spreading code used it can mitigate the loss due to the two most common problems in communication multiple access interference (MAI) and multipath interference (MI).

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BIOGRAPHY

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