The simulation result in Figure 4 shows that the OFDM-IDMA technique for 24 users with data length 256, keeping spread length of 16 bits have Bit Error Ratio (BER) of approx. $9* 10^{-5}$, which shows that there 9 bits errors out of 100,000 bits. Chip length can be calculated by multiplying data length (m) with the spread length (sl). Number of iterations taken is equal to 15.

Case 3: Block = 20
Number of user (n) = 24
Data length (m) = 256
Spread length (sl) = 32

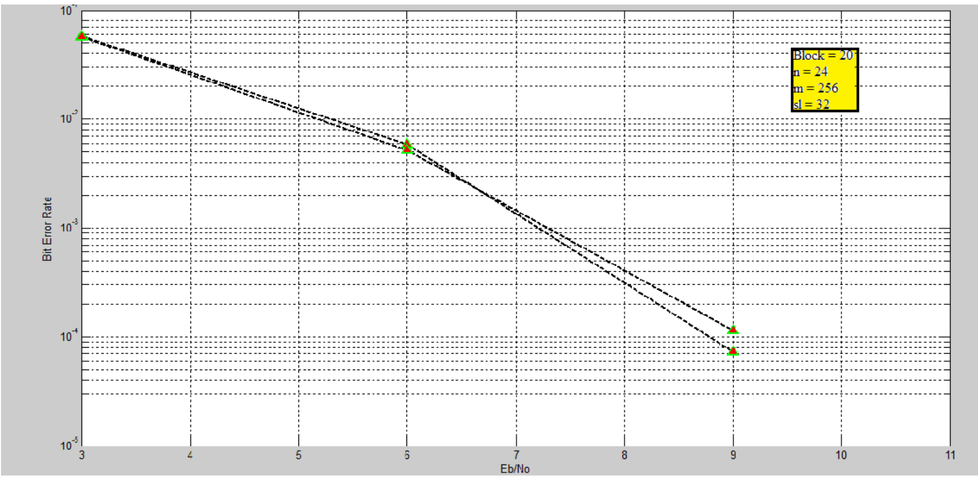

Figure 5: BER analysis of OFDM-IDMA system for m = 256 and sl = 32

The simulation result in Figure 5 shows that the OFDM-IDMA technique for 24 users with data length 256, keeping spread length of 32 bits have Bit Error Ratio (BER) of approx. $7* 10^{-5}$, which shows that there 7 bits errors out of 100,000 bits.

Chip length can be calculated by multiplying data length (m) with the spread length (sl). Number of iterations taken is equal to 15.

Case 4: Block = 20
Number of user (n) = 24
Data length (m) = 512
Spread length (sl) = 32

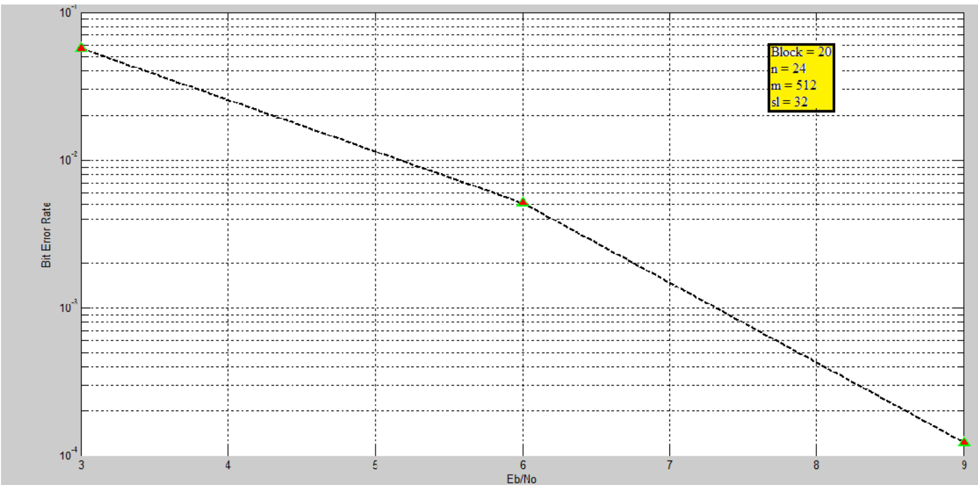

Figure 6: BER analysis of OFDM-IDMA system for m = 512 and sl = 32

The simulation result in Figure 6 shows that the OFDM-IDMA technique for 24 users with data length 512, keeping spread length of 32 bits have Bit Error Ratio (BER) of approx. $10* 10^{-5}$, which shows that there 10 bits errors out of 100,000 bits.

Chip length can be calculated by multiplying data length (m) with the spread length (sl). Number of iterations taken is equal to 15.

5. Result Comparison of IDMA and OFDM-IDMA System for Different Parameters

Table 1: Result Comparison of IDMA and OFDM-IDMA System for Different Parameters

Parameters →		*Block*	*No. of users (n)*	*Data Length (m)*	*Spread Length (sl)*	*BER*
IDMA		20	24	512	16	$2 *10^{-4}$
OFDM-IDMA	Case 1	20	24	512	16	$8*10^{-5}$
	Case 2	20	24	256	16	$9*10^{-5}$
	Case 3	20	24	256	32	$7*10^{-5}$
	Case 4	20	24	512	32	$10*10^{-5}$

From the above comparisons it is observed that when number of users are kept 24 for block of length 20, keeping spread length 16 and data length 512 the BER for IDMA is $2 *10^{-4}$ means there are 20 erroneous bits when100,000 bits are transmitted, whereas for OFDM-IDMA system the BER is $8*10^{-5}$ means there are 8 erroneous bits when 100,000 bits are transmitted, showing high data rate for OFDM-IDMA system with less number of error bits. Other results for BER are analyzed with different spread length for OFDM-IDMA system with same number of users and same and different data length showing better results for high spread length.

6. Conclusion

On the basis of proposed simulation, the performance of OFDM-IDMA system is better than the other methods. The bit error rate of 24 users with 16 and 32 spread length is almost same in Figure 2 and Figure 3.

In the proposed work, the performance comparison of two multiple access techniques i.e. between CDMA and IDMA have been presented. Comparisons between different Multiple access techniques have been made on the basis of parameters like number of users, spreading length used among the users, etc. On the comparison basis the IDMA shows its better suitability for the applications to support multimedia services in broadband wireless network for fourth generation communication. Whereas, OFDM with IDMA is better in performance. In Figure 2 and Figure 3 shows OFDM-IDMA performance gain over CDMA and IDMA. Although the performance IDMA technique is well suited for next generation, but still there are some challenging issues in this scheme such as inter-leaver design, coding scheme, channel behavior, optimum signaling scheme etc. These issues can be resolved to some extend when used with OFDM scheme as the problem of ISI can be eliminated.

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