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BER Performance of Image Transmission over MIMO-OFDMA with Sparse Technique by Antenna Diversity Scheme

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ABSTRACT

Multiple-Input Multiple-Output based Orthogonal Frequency Division Multiple Access (MIMO-OFDMA) along with sparse technique is an encouraging interface technology. MIMO channel can bid a substantial gain over an outmoded single input single output network. In this paper an impression of MIMO-OFDMA with sparse technique will be given, for promising performance. Antenna selection is apprehended to improve overall BER on MIMO channel guesstimate. Adaptive M-QAM modulation is achieved on selected antenna on each subcarrier.

Keywords: MIMO (Multiple-Input Multiple-Output), OFDMA (Orthogonal frequency division multiple access), BER (Bit Error Ratio), QAM (Quadrature amplitude modulation), etc.

1. INTRODUCTION

Wireless networks are not utilizing any physical mean to communicate with each other. The wireless networks communicate amongst the nodes, these nodes are communicating with the help of radio waves, infrared light or laser. The upcoming future wireless techniques need to face a single and most challenging demand of high data rate transfer with greater preciseness. Orthogonal frequency division multiplexing is advancement with no intra-cell interference and most efficient multiple access technique [1]. OFDMA improve the spectrum efficiency by both frequency domain and multiuser diversity [2]. In addition, Multiple-Input Multiple Output (MIMO) is highly convincing technique to meet the challenges of upcoming wireless network's demands; it facilitates higher data rate transfer without even increasing the bandwidth of the channel or transmission power. For improvement in desired results multiple antennas are used at transmitter and receiver [3].

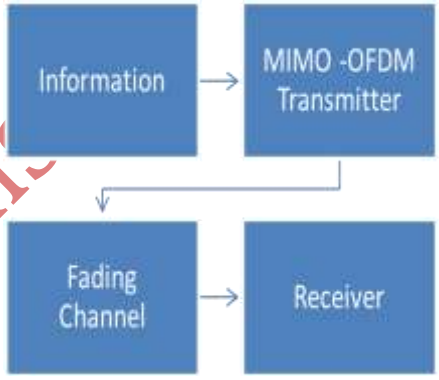

Fig 1: MIMO-OFDM communication system

2. METHODOLOGY

```
ns=300;

M=16;

cr=1/2;

nbit=cr*192;

data=randint(ns,nbit,M);

serdata=reshape(data,ns*nbit,1);

bdata=de2bi(serdata,log2(M));

bsdata=reshape(bdata,ns*nbit*log2(M),1)
;

pt=poly2trellis(3,[6 7]);

cdata=convenc(bsdata,pt);

cdata1=reshape(cdata,2*ns*nbit,log2(M))
```



```
;

mapping_in=bi2de(cdata1);

mdata=qammod(mapping_in,M);

pdata=reshape(mdata,ns,192);

ifftin=[zeros(ns,64) pdata];

ifftdata=ifft(ifftin);

cpdata=ifftdata(:,193:256);

ofdm_sym=[cpdata ifftdata];

sertxdata=reshape(ofdm_sym,ns*320,1);

[separated_data]=coherent_ZF_receiver(n
data,h,'OSTBC4','3/4',1);

prxdata=reshape(ndata,ns,320);

cprdata=prxdata(:,65:320);
fftdata=fft(cprdata);

zrdata=fftdata(:,65:256);

srdata=reshape(zrdata,ns*192,1);

dmdata=qamdemod(srdata,M);
dmdata1=de2bi(dmdata,log2(M));

dmdata2=reshape(dmdata1,ns*192*log2(M),
1);

dcdata=vitdec(dmdata2,pt,32,'trunc','ha
rd');

[nerr ber(i)]=biterr(dcdata,bsdata);

end

figure(1)

semilogy(snr,ber);

xlabel('SNR')

ylabel('BER')grid on
```

3. RESULT & SIMULATION

3.1 System Description

A simulation was done to compare the BER performance of the proposed Sparse MIMO OFDMA system with recent MIMO OFDM based system. The block diagram used for the methodology is arranged in the below diagram along with simulation results.

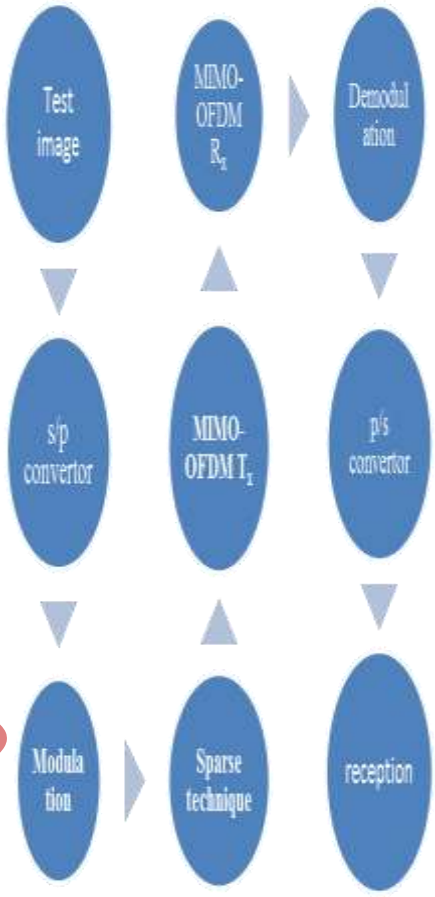

Fig 2: Block diagram of Sparse MIMO-OFDMA system

Fig 3: Test Image

3.2 MIMO 2x1, 2x2 and 2x4 antenna using QAM-16 technique

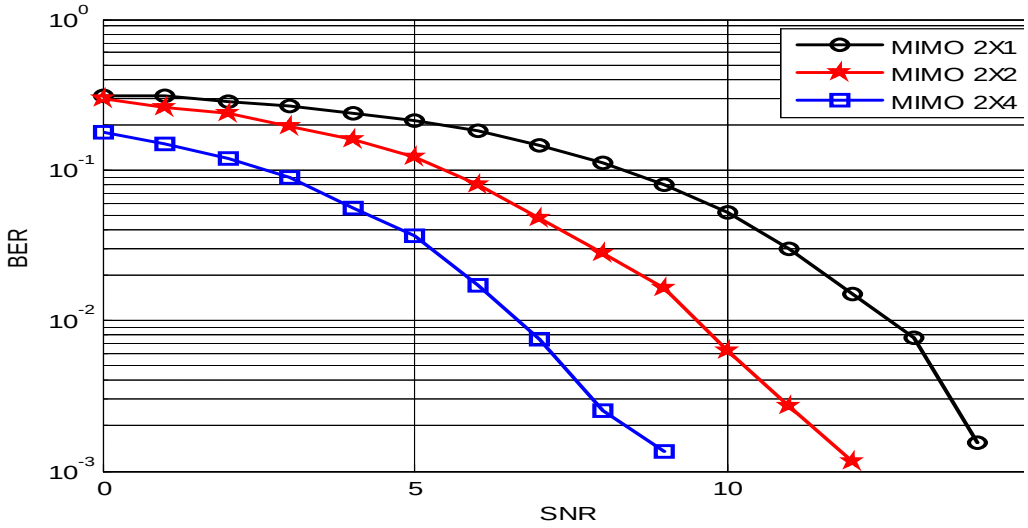

Fig 4: BER performance of transmission MIMO-OFDM using QAM-16

3.3 MIMO 2x1 antenna using QAM-4, 8, and 16 technique with sparse technology

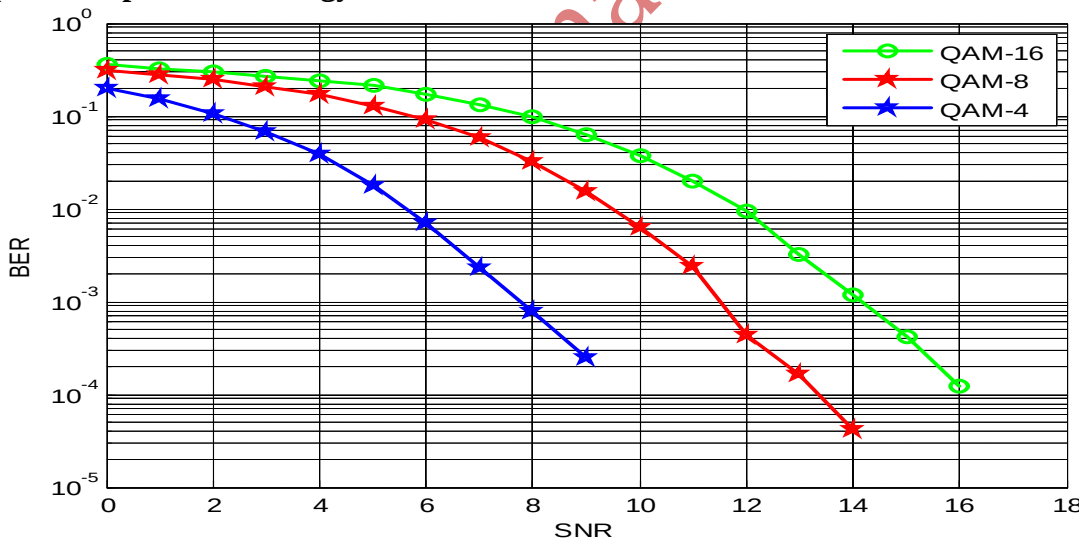

Fig 5: BER performance of MIMO-OFDM with sparse technique

4. CONCLUSION

The image was the required information data which need to transmit at high data rate with low error rate. Transmission of the test image over wireless communication affected due to channel and other physical phenomenon. It is found that with the increase of modulation order the capacity enhancement but BER are degraded, the can be recovering with the increase in number of receiver antennas.

5. ACKNOWLEDGMENTS

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6. REFERENCES

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