International Journal of Research
Available at https://edupediapublications.org/journals
p-ISSN: 2348-6848
e-ISSN: 2348-795X
Volume 03 Issue 13
September 2016

Performance Analysis of Adaptive Mu-Mimo System

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ABSTRACT:

A large multi-user scalable multi-input multiple-output (MIMO-MU) Wireless Communications systems, reference to the base station (BS) is made is equipped with a very large The number of antennas (users) gain from very high performance due to high Data and spectral efficiency and reliability can be achieved rates. In a multi-user system independent wireless communication (i.i.d.) and a similar distribution camouflage compound (Rayleigh fading) channels allow multiple antennas Users of independent computers (EU) to transfer transmission data stream At the same time, or BS to transmit multiple streams of user data have to be decoded Each UE on the downlink. In this work, the bit error rate (BER) for large beamforming scale of MU-MIMO system with different types of pre-coding and schemes adjusted the signal to noise ratio (SNR) is evaluated. Two Ways to design the composition of the beam and the pre-chosen channel coding for better need performance and SNR considered- of any communications system is High-speed data with greater accuracy and reliability. Orthogonal Frequency Division Multiplexing (OFDM) It provides an optimistic solution to achieve high data rates In a wireless environment. orthogonal frequency division Double (OFDM) is one of the multicarrier Modulations, and that all sub-channels Dedicated to a single source of data OFDM transport system, and each sub-attenuated Individually low frequency selective fading fast Channel. If the same system is used for a fixed transfer All OFDM subcarriers, leading to high attenuation and And therefore deficient performance. Multiple Input Multiple Output when communication systems (MIMO) combined with OFDM system can achieve high data transfer speed In multi-channel wireless broadband. The purpose of this Paper to compare the mono input and output setting (ASISO) setting -OFDM with multiple inputs and multiple Output (AMIMO) -OFDM system Why is MIMO It was better than SISO. Based on the calculated average instantaneous signal to noise ratio (SNR) of the same composition Scheme applies to all subcarriers of the same block. The error rate average bit (BER) MIMO-OFDM Under the fixed

system and configuration to fit modification observed. Simulation results show that the The performance of MIMO-OFDM system using BER It is modified to fit better than the fixed modification.

INTRODUCTION:

The multiple-input multiple-output (MIMO) wireless systems It has been extensively studied in recent years, and applied to many wireless Standards due to the fact that the channel capacity and reliability [6] is improved. In For a single user MIMO (SU-MIMO) system data and high-speed link from point to point The transmission can be supported by multiple space while providing space diversity gains. In addition, SU-MIMO systems multiply the gains disappear when The signal strength is low in relation to interference and noise, or in the publication With a dominant line of sight environments or a few distractions. Practical Restrictions on the size of the terminals also limit the number of antennas that can be used Thus doubling the gain [13]. However, most communications Dealing with multiple users sharing the same radio resources in systems It is to provide multiple mobile terminals by a base station. Utilization MIMO is considering large-scale technology as a potential technology The fifth generation (5G) wireless systems due to the high levels of efficiency / amount of spectrum, and increasing the reliability and energy efficiency [8]. MU-MIMO Wireless system has gained a lot of attention, as it can A significant increase in data transfer and achieve higher speed increase diversity gains. Consider multi-stream each user of MU-MIMO system, the base station (BS) Communicate with multiple users on the same frequency ranges and time, each Receives multiple current [4] users. Tin. 1 illustrates a typical multi-user MIMO (MUMIMO) Contact environment in which multiple mobile stations (MS) or It is to provide users with all the multiple antennas for a title and multigrade Antennas in the communication system. Given the diversity of a multi-user, and The performance of MU-MIMO systems are generally less sensitive to publish Environment than it was in the case of MIMO point-to-point [6]. To achieve a high system Power, energy and spectral efficiency, user equipment (UE) is communicating Through orthogonal channels. Deletion of the intervention can be achieved by using descending strong precoding techniques. Therefore, suppression of parasites Crucial in the formation of design beam transmission. It could be the benefits of transmission Lost

through detection algorithms UES transmitter and forced zero (ZF) And the yard minimum average error (MMSE). Benefits downlink (signal The analysis is carried in large MIMO) and compared with the results dirty paper coding (DPC), block diagonalization (BD) and TomlinsonHarashima Precoding (THP) [7].

IMPLEMENTATION:

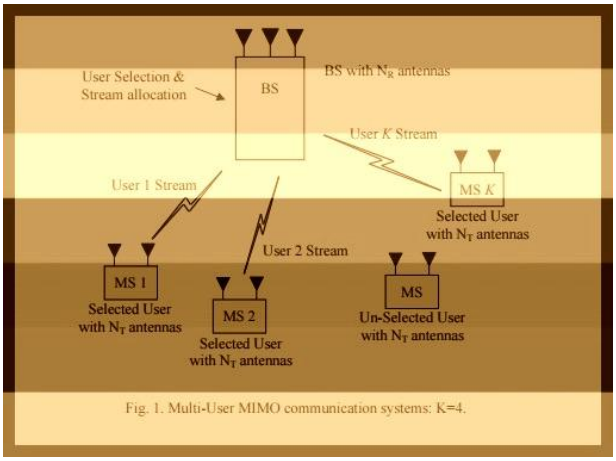

Fig. 1. Multi-User MIMO communication systems: K=4.

Fit. 1 K-1 and K are chosen users personalize communications Resources such as time and frequency, and spatial sequence. Suppose the BS and Each MS is equipped with NR antennas and NT, respectively. As K independent Forming an antenna groups K·NT virtual users communicating with a BS With NR antennas, and it can be considered as the end to end configuration as (K·NT) × NR MIMO downlink system, the MIMO system or NR × ascending link (K·NT). in this multi-user system, multiple communication antennas allow independent users To transfer your data stream transmission (many to one) at the same time The use of algorithms or BA ZF and MMSE to move data from multiple users Streams to be decoded by each user on the downlink (one to many) using the DPC, BD and THP. This was due to increased degrees of freedom Multiple antennas compared to the MIMO system a single user. In a multi-user MIMO system, called downstream and upstream channels that transmit Channel (BC), and multichannel access (MAC), respectively. In [6], and said a huge MIMO systems from several different viewpoints The recipe. Through the BS is equipped with a large number of antennas, and spectral It can improve the efficiency of energy use. For great benefits for MIMO In fact, there is a significant need for further research on a number of issues, including link channel, devices and applications impairments, interference Management and modification. In [7], and antenna systems, the ability to achieve large-scale future The needs of wireless communications systems and also promised to give productivity Over the 4G systems. He gave his idea of using the huge MIMO systems for increased performance in communications systems. Huge MIMO systems with multiple antennas placed in a

hundred improvement BA The spectral efficiency considerably. Effective distribution of a huge scheme MIMO is an antenna design intensive. Furthermore, this technique showed DPC Better performance compared to BD and THP. In [8], and the proposed low complexity detection algorithms widely MIMO spatial modulation (SM-MIMO) systems. NOTE interesting The results of the simulation are that the SM-MIMO MIMO mass exceed several DBS for the same spectral efficiency. Similar performance improvements offered in Saleh SM-MIMO in a frequency selective fading. SNR advantage SMMIMO Attributed to the massive MIMO for the following reasons: (a) due to the little spatial index, the SM-MIMO system can use less frequently on the square Modulation (QAM) alphabet compared to what it was in the huge MIMO to achieve The same spectral efficiency, and (b) for the same spectral efficiency and size QAM, You will need more than sheer MIMO spatial streams for each user who causes an increase spatial intervention. In [9], and the problem of pollution in various MIMO pilot huge cells It has been studied systems under correlated channels, and simulate the MATLAB program. Simulation results show that the performance of a massive MIMO systems worsen when the channels are connected. When Large enough correlation coefficient channels, and a tremendous performance Too bad for MIMO systems work. When the channel correlation coefficient Smaller than a certain value, and high performance MIMO It can effectively improve with the increased number of BS antennas. While the correlation coefficient exceeds a certain value channel, huge performance MIMO systems is improved by increasing slowly The number of BS antennas. In [13], the linear performance before coding for MIMO downlink very large He studied channels. They show that the channels used, studied at residentialarea The deployment environment can not correlated using a large reasonable antenna arrays at the base station. With linear precoding, and rates up 98% of the capacity of DPC two users BS antenna and antennas 20 Check. These have shown that, even in environments published realistic and With a relatively limited number of antennas, and the benefits of a large number of It can be observed antennas used in the BS. In [14], and we have seen that the MU-MIMO limited reactions, the remaining system (ZFBF) transfer a multi-user intervention created even beamforming ZF Reducing performance. When each user is not aware of other users Channels, and

improve performance through the exact channel quality index (CQI) Estimate, receive beamformer and channel selection expression is completely Challenge. Simulation results that can improve performance demonstrated It can be obtained by designing both the reception beamformer codeword channel for Improve SINR / CQI. In addition, the BS can further improve performance through CQI adjusted each user based on channel feedback real coscheduled Users. The results have shown the system level, even with limited Reactions operating systems MU-MIMO, you can achieve a multi-user MIMO gains to be Improvement. In [15], taking into account the standard THP algorithm descending MUMIMO It does not provide the flexibility to distribute advanced user, and THP Amendment The proposed algorithm that accepts arbitrary linear precoder effectiveness. The The authors studied the special case of THP (ZF-THP) with arbitrary user, forcing zero Distribution of power and the distribution of power derived optimal user to maximize weighted average number of users. In our work, the performance of linear precoding techniques taught two Amendment schemes (QPSK and QAM 16) for beamforming and large scale MUMIMO The study of systems through simulation. We consider the environment from a single cell That a degree of the antenna with a wide range serves a number of multiple antennas Users at the same time.

SIMULATION RESULTS:

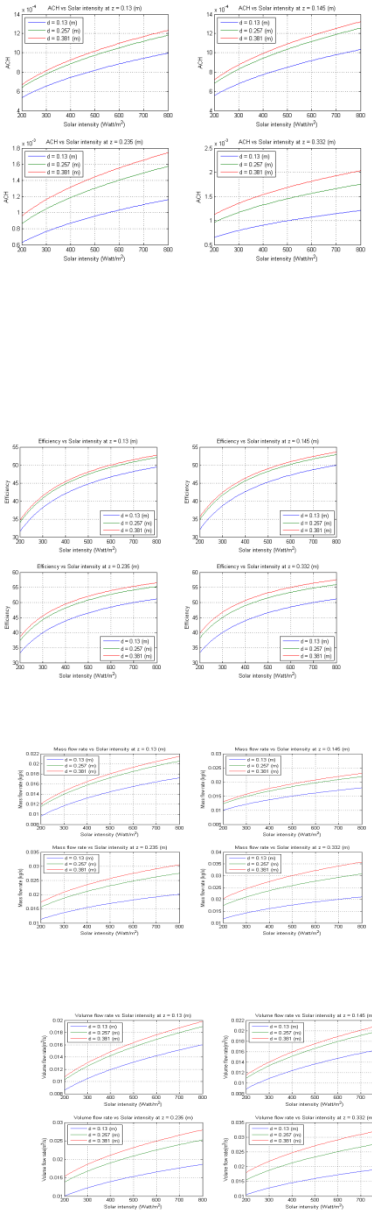

Fig: Performance analysis of spectral efficiency improvement for large scale MU-MIMO system

CONCLUSION:

Beamforming large MU-MIMO scalable performance Communication systems are evaluated based on the mainland. We were BD and CPD precoders THP in the transmitter, and ZF and MMSE detections schemes Welcome, to eliminate the ISI and improve overall performance. In this way we are The analysis contained in the extended [6] [8] [9] [14] where there precoding with any ZF or MMSE discovered and used in programs [13] [15] in which the DPC or THP precoding method is used. System performance under different types of It has been studied and consider modifying plans AWGN and Rayleigh fading channels using MATLAB programs expand the scope of analysis in [13] [15], where Uses a Gaussian channel, in [7] [8] where it is supposed not to lose track in the channel. It was found that further enhance performance can be achieved through The use of BD, CPD and a CPD preferably THP compared to others. US We note that the use of detection, ZF and MMSE such as strengthening system algorithms Preference for performance compared to MMSE ZF. Compare results Given the 2 in Figure 3 in his hand to indicate that the type of modulation (QPSK and QAM16) that clearly affect system performance compared [7] [9] [13] [15] which says nothing about the composition. At the same time, comparison tables, it can be seen that the performance of QPSK modulation technique is better than QAM16 especialy in the range SNR is low. Simulation results show that the use of multiple transmitters and antennas Multiple antenna reception with multiple users provides good performance BER As SNR large number of private antennas. Finlay was Verified that the spectral efficiency of the MIMO system increases if the number of Antennas increases, in our study the greatest values of NT = 20 were obtained and NR = 20. As a result spectral efficiency can be explained by the fact that the systems With a large number of antennas having a narrow width compared with radiation antenna system and the beamwidth of resource allocation and transmission power control procedures can be more effective. Allowing said Finlay The values obtained represents the only limit that can not be achieved in the case of Fully aware of State for Information and channel if both prose You can consider things and uncorrelated antennas.

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