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Communications Performance Enhancement and Analysis of Diversity Techniques for Broadband Wireless

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Abstract:

In this section, we can obtain a multiple-input multiple-output (MIMO) technique combining transmit antenna Selection and receiver maximal-ratio combining. In this technique, a single transmit antenna, which increases the received signal power at the receiver, is selected for non coded transmission. When we are using receiving diversity scheme then we found MRC Technique is given better result and for transmit diversity we found transmit beam forming is better. After an overall conclusion, we obtain that MRC at receiving end is best overall. The results output provides us that the less Bit error rate as we increase the antenna configuration. It is shown that the MRC scheme outperforms some more different space-time coding of the same efficiency.

Key words: MRC, MIMO, Multipath fading

1. Introduction

The analysis of wireless broadband communication systems is totally governed by the wireless channel environment. It opposes to the typical static performance of a wired channel signal, the wireless channel is rather dynamic, which makes a different study of the wireless communication system often difficult. Last few years, communication system becomes very critical because of the rapid growth of mobile communication services. Here wireless communication, radio propagation concern to the Nature of radio waves when they are propagated from transmitter to receiver. There are three modes such as reflection, diffraction, and scattering which can make effects of radio waves. In our world Communications between creatures is very important and useful. Wireless communication Customer needs and technology requirements, these two play a vital role to make their own market in the wireless communications. For the best result in mobile communication Mobility or non-tethered communications are required. In mobile communication Mobility ensures to communicate anytime and anywhere. Now Mobile communications technology must be able to allow roaming. Roaming is the ability to provide usability to the mobile phone users while they are not inside of their home network. We can take fixed wireless is just an alternative to wired communications. But the fixed wireless users do not get the mobility facility but they need cost effective communications from their fixed locations. The alternative of wireless is a means of providing service is the only means. When any customers attempt to communicate from the remote locations, Satellite is the only alternative. Now Wireless communication is a revolution of human communications. The technology to send idea, approach and information to remote location could not even be imagined before wireless communication technology was invented. For the last couples of years, the subscribers of wireless communications have an exponential growth and increased. The current progress in radio technology given more and more new and improved services. Current wireless services contain transmission of fax, voice service and low-speed data rate very easily.

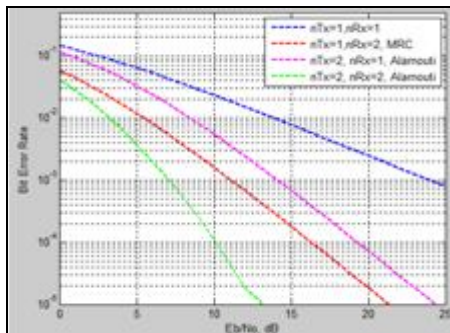
2. System Model

It is need of wireless communication to combine the uncorrelated faded signal which is obtained from the diversity scheme to get total diversity benefit. If we combine the system that involves the performance of the communication system. Diversity combing also increases the signal to noise ratio and power of receiving signals. Main part of increasing power at reception. But this is also possible at transmission mainly we have Maximal ratio combining (MRC), equal gain combining (EGC), selection combining (sic). The combining process consists two classes such as post detection and pre detection. For coherent detection the both combining techniques, the communication performance is same. If we are using pre detection, combining it will give better performance for non

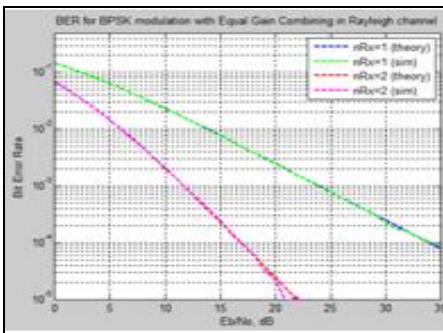
coherent detection.

Antenna Diversity:- Antenna diversity used because it is most popular and extensively technique to get better performance in wireless broadband communication. This technique detects and reduces fast fading and inter-channel co- interference effects in the wireless system. We can say that in the antenna diversity system, two or more antennas are used and fixed in positions which will allow uncorrelated signals with the same power level. Then the signals are mixed or combined and given an improved signal. As we can found in history the first space time block coding is alamouti code ,it offers us full diversity of full data rate for ant two transmit antenna. But in Equal gain combining performance comparable to optimal maximal ratio combining receiver is better. If we evaluate the performance of EGC diversity at receiver it is known to be a much difficult task in compare to other classical diversity schemes. If we talk about selection diversity, at receiving end it is first diversity for a wireless link. Receiver diversity is a part of space diversity that contains multiple antennas at receiver. As we discuss about transmit beam forming where the transmitter known about the channel which passes the signal. It is a close loop diversity scheme. At the receiving end it needs a feedback from the receiver, to send data the channel known by the receiver to the transmitter.

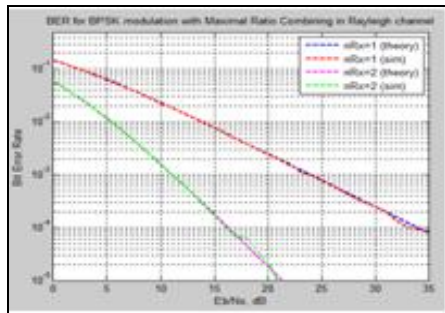
3. Result



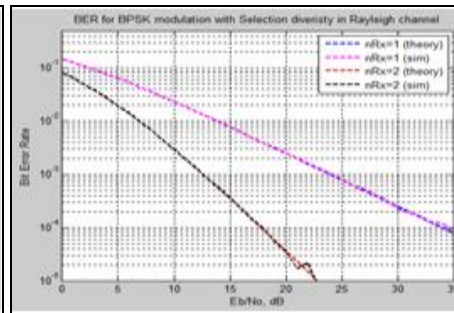
Graph 1: Alamouti diversity showing BER



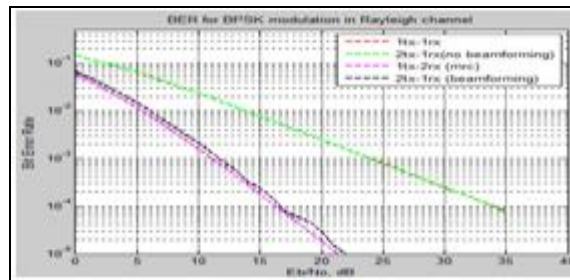
Graph 2: Equal Gain Combining



Graph 3: MRC



Graph 4: Selection Diversity



Graph 5: Transmit Beam forming

4. Conclusion

In the wireless communication, for a better output we have used diversity technique. A diversity scheme provides two or more inputs at the receiver like the fading effect on these inputs are those not related with each other. when we are using diversity at receiving end we found Maximal ratio combining (MRC), technique is best and when we are using diversity at transmitting end we found transmit beam forming is best but over all maximal ratio combining is given high performance.

5. References

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