

UNIVERSITI TEKNOLOGI MARA

**PRECODING TECHNIQUE FOR OPTIMUM
SPECTRAL EFFICIENCY IN MASSIVE MIMO
SYSTEM**

MUHAMMAD FIRDAUS BIN HASHIM

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Abstract

Massive MIMO is used in a new generation wireless technology and a method to improve the spectral efficiency (SE) of communications systems. Nowadays, because of the users and applications that are always increasing day by day the improvement of wireless technology shall be in line according to demand. In this paper, precoding technique used to optimize spectral efficiency and the number of user as a function of the number of antenna with different interference condition are investigated. From the simulation, SE per cell for precoding technique and corresponding number of scheduled users K^* can be seen. As the number of antenna at base station (BS), M increase the SE will increasing. The K^* depends on the intercell interference condition strongly.

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CHAPTER 1

1.0 INTRODUCTION

1.1 Massive MIMO

The high capacity and faster data transmission with minimum losses and error are actually the priority of the wireless communication system for nowadays. Various applications is needed such as the video streaming, portable gadgets and so on demanding a host of data in wireless communications. In order to achieving high rates in wireless communication systems, the upgraded technology such as massive MIMO system is needed. This paper stress the massive MIMO concept that has been identified as the key to increase the performance of the spectral efficiency (SE).

Massive MIMO system is a new technology upgraded from the conventional MIMO system where more than hundreds or thousands antennas used at base station (BS). Basically, this new system widely used in wireless communications to improve the channel capacity besides to reduces the error and costs [1]. By increasing the number of antennas, massive MIMO able to increase data rate since more independent data can be sent out and more terminals can be served simultaneously. Apart from that, massive MIMO can reduce the interference because of the BS can purposely avoid transmitting into directions where spreading interference would be harmful [1]. The illustration of massive MIMO shows as Figure 1.1.