UNIVERSITI TEKNOLOGI MARA

IMPROVING ENERGY EFFICIENCY IN MASSIVE MIMO SYSTEM WITH NON IDEAL HARDWARE

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ABSTRACT

Massive Multiple Input Multiple Output also known as Massive MIMO is promising next generation for wireless network technology, with large number of antenna at base station mean large scale radio frequency chains. It will be the biggest challenge to wireless communication system when energy consumption meets the needs of growing traffic. High cost for build Massive MIMO with Ideal hardware compare to Massive MIMO with non-ideal hardware. This study focus on comparison energy efficiency between ideal hardware and non-ideal hardware in Massive MIMO system. In this paper, energy efficiency has been analyses from N antenna at base station and single antenna user transceiver. Result shows massive MIMO non ideal hardware can achieve energy efficiency.

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CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION

Wireless communication system has been evolving from time to time. Lots of technologies have emerged such as Single-input single-output (SISO), Single-input multiple-output (SIMO), multiple-input Single-output (MISO), multiple-input multiple-output (MIMO) and Massive multiple-input multiple-output (MIMO). All of the technologies have their own advantages and disadvantages in term of energy efficiency and spectral efficiency. Massive MIMO is a promising core technology in future wideband wireless communication systems, and has a great potential of high spectral and energy efficiency [2]. Massive MIMO also known as Hyper MIMO is an emerging wireless technology, where each base station is equipped with twenty or hundreds of small active antennas and communicates with single antenna terminals over the same bandwidth frequency at one time. The vision of massive MIMO is new. It processes the signal over the array, uses transmit precoding in the downlink to focus each signal at its desired terminal and receive combining in the uplink to discriminate between signals sent from different terminals [3].