

**UNIVERSITI TEKNOLOGI MARA**

**INTERFERENCE MITIGATION BY POWER  
OPTIMISATION AND FREQUENCY REUSE  
TECHNIQUE ON FEMTOCELL LTE NETWORK**

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## **ABSTRACT**

A femtocell is a tiny and low-power base station maximum power of transmission implemented in the building; commercial office or house which can be deployed via DSL connectivity. This femtocell network offers more adaptability and versatility for the deployment into existing structure. This will solve the problem of coverage at the cell edge of the macrocell coverage and also to the simplified concept of conventional LTE deployment.

This report presents the analysis of interference mitigation method on femtocell in LTE network. Femtocell deployment required to providing better coverage for the user in the building. The simulation technique power measurement & frequency reuse using EXata Qualnet 5.3. The simulation results conclude the mitigation technique can reduce the interference and give better user experiences.

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# CHAPTER ONE

## INTRODUCTION

### 1.1 RESEARCH BACKGROUND

World population has increased, and the technology of cellular network has growth rapidly. Year by year, user of mobile network increased due to the affordability of mobile devices such as smartphones, tablets, and various hand-held units. According to Ericsson Mobility Report June 2015, mobile data traffic in Q1 2015 was 55% higher than in Q1 2014 [1].

In order to meet the demands of mobile data traffics, and giving better performance quality of service (QoS) to the subscribers, cellular technology is developed and formulated in order to grow rapidly at an accelerated pace. Long Term Evolution (LTE) is one of the cellular technology evolutions that has moved towards LTE-Advanced (LTE-A as well as 4G technology named IMT-Advanced. LTE Advanced is the commercial deployment of IMT-Advanced and part of 3<sup>rd</sup> Generation Partnership Project (3GPP) Release 10. To achieve higher data rates, LTE/LTE-A deployed in high frequency band, and the penetration loss will be high which lead to poor indoor coverage [2]. In fact, higher power needed since the transmitter and receiver far distance to each other and expensive macrocell network.