UNIVERSITY OF MORATUWA
SRI LANKA.

ESTIMATION OF PROPAGATION CHARACTERISTICS IN MOBILE ENVIRONMENT

Submitted in partial fulfilment for the degree of Master of Engineering in Electronics & Telecommunications

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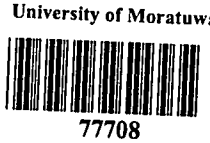

August 2002

The work presented in this dissertation has
not been submitted for the fulfillment
of any other degree

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Acknowledgement

Dr. (Mrs.) Dileeka Dias deserves many thanks for spending her invaluable time from her busy schedule to supervise this and also to suggest solutions for the problems which could otherwise lead to a total failure.

I am deeply indebted to Prof. (Mrs.) Dayawansa in most of all for her kind guidance and encouragement to proceed with this project.

My special thanks go to Telecommunication Regulatory Commission for providing me the opportunity and necessary equipment to carry out this project and also to my colleagues who helped me a lot in numerous ways.

Quite number of people who helped in numerous ways are also acknowledged even though it's hard to mention individually.

Last but not least, my deep gratitude is extended to my family and close friends for their encouragement and helps right throughout the time without that this won't be a reality.

Contents

Abstract

Propagation in land mobile services including cellular is affected in varying degrees by topography, vegetation, man made structures, ground constants, the troposphere and the ionosphere. Also propagation of energy is strongly influenced by several factors including the natural and artificial relief, propagation frequency, antenna heights and others.

The mobile radio signal varies in time and with spatial displacement. Even in the static case where the transmitter and receiver are fixed, the channel can be dynamic, since scatterers and reflectors are likely to be in motion. Thus multipath arises from the fact that through reflection, diffraction and scattering radio waves can travel from a transmitter to a receiver by many paths. Hence a precise estimation of signal characteristics in this environment constitutes a hard task.

The thesis describes exercises in the estimation of the characteristics of cellular mobile signals operating in 900 MHz band through the real measurements obtained in different environments in Sri Lanka and the results of these exercises. Even though similar researches have been conducted in places like Europe, North America and Japan to derive empirical formulae such as Okomura- Hata Model, ITU-R P.529, COST231, no study has been done as yet to check the suitability of these models to the Sri Lankan environment.

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