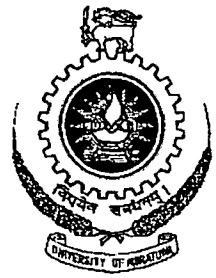

UNIVERSITY OF MORATUWA
SRI LANKA.

ESTIMATION OF PROPAGATION CHARACTERISTICS IN THE FM ENVIRONMENT

Submitted in partial fulfilment for the Degree of Master of Engineering in Electronics and Telecommunications

E.N.P.K.Ratnapala

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DECLARATION

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

E.N.P.K.Ratnapala Candidate	Prof (Mrs.) I.J. Dayawansa Supervisor	Dr (Mrs.) Dileeka Dias Supervisor

DEDICATION

To my loving parents who knew I could do it long before I did it

To my wife Deepika, for her boundless patience and understanding

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ABSTRACT

Electromagnetic Compatibility (EMC) analysis involved in the planning process of a FM broadcasting service is an intricate and complex procedure, which is dependant fully on the propagation prediction models. For these predictions theoretical and empirical models are used. But the applicability, approach, complexity and the accuracy of each of these models can differ by a wide margin, producing lack of confidence and higher degree of uncertainty. Therefore choosing a model for a specific EMC Analysis with the required accuracy is of primary concern.

Most of these models have been developed in many parts of the world. Stringent validation of these models as distinct to the Sri Lankan environment is an essential requirement by testing on locally collected data. But apparently due to the extent of measurement and analysis facilities required this had been a minority activity.

In this research work the applicability of generally acceptable empirical and theoretical propagation models such as free space (L_F), plane earth (L_P), modified plane earth (L_P'), Max (L_F, L_P), Max (L_F, L_P'), ITU PN 370-6, FCC are compared for their performance for typical rough and irregular terrain commonly found in Sri Lanka by observing the received signals of FM sound broadcast transmissions originating from Nuwara Eliya and Colombo.

The results show that theoretical model Max (L_F, L_P'), is the most accurate model for FM broadcast environment in Sri Lanka. It is seen that this model, yields most accurate results even in irregular terrain with Epstein Peterson diffraction correction.

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