بسم الله الرحمن الرحيم

شبكة المعلومـــــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـــسـم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون آية تغيرات

يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

Ain Shams University

Faculty of Engineering

Electronics & Communication Engineering Department

PERFORMANCE ANALYSIS OF CODE DIVISION MULTIPLE ACCESS SYSTEM TRANSMITTED THROUGH NONLINEAR MOBILE SATELLITE CHANNEL

By

Eng. Mohamed Ghaleb Mayhoub

A Thesis

Submitted in partial fulfillment of the requirements for the Degree of Doctor of philosophy in Electrical Engineering

Electronics and Communications Engineering Department

Under the supervision of

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Cairo

1998

بسم الله الرحمن الرحيم

STATEMENT

This thesis is submitted to Ain Shams University in Partial fulfillment of the degree of Doctor of philosophy in Electrical Engineering.

The work included in this thesis was carried out by the author in the Department of Electronics and Communication Engineering, Ain Shams University.

No part of this thesis has been submitted for a degree or a qualification at any other university or institute.

Name: Mohamed Ghaleb Mayhoub

Signature :

ACKNOWLEDGMENT

No words can ever express my sincere gratitude to all the people who contributed to the fulfillment of this work.

I would like to express my appreciation to ***Prof. Dr. Safwat Mahrous Mahmoud*** for his kind supervision, useful assistance and advice devoted of finish this thesis.

I wish to express my deep gratitude and respect to my supervisor ***Prof. Dr. Hadia. El-Hennawy*** for her continuous guidance and support. She has introduced all the facilities in the communication laboratory. Her helpful and valuable discussions, guidance and strict notes were the major factors in completing these work.

I am grateful to ***Ass.Prof. Dr. Refaat Hassan El-Zanfally*** for continuous help, encouragement, and the plenty of time he has devoted to me. I would like also to thank them very much for supplying me with papers, books and many information.

I would like to thank the Electronics and Communication Engineering. Department in the of Faculty of Engineering, Ain Shams University, for the helpful comments, encouragement, and the unlimited assistance during this work.

Finally, let me thank my family, my parents and let me thank my friends, who have help along the way.

ABSTRACT

Mohamed Ghaleb Mayhoub. Performance analysis of code division multiple access system transmitted through nonlinear mobile satellite channel. Doctor of Philosophy Degree, Ain Shams University. Faculty of Engineering. Electronics and Communication Eng. Dept.

This work introduces two important subjects. The first one studies, the performance analysis for one user of the direct sequence spread spectrum (DS-SS) signal transmission through nonlinear mobile satellite channel, while the second one introduces the performance analysis for multi-user of the direct sequence code division_multiple access (DS-CDMA) signal transmission through nonlinear mobile satellite channel.

The performance of DS-CDMA system, is performed using an analytical model with both Gaussian process (GA) and improved Gaussian approximation (IGA). Because of the inaccuracy of the Gaussian approximation for the multiple access interference (MAI), an improved Gaussian process with good accuracy has been used.

The impairments taken into consideration in the system are : nonlinear effect of travelling wave tube (TWTA) on-board satellite (AM-to-AM and AM-to-PM conversions), additive white Gaussian noise (AWGN), multiple access interference, and mobile propagation channels which includes Shadowing, Rician, and Rayleigh effects, to describe propagation in suburban, open, and urban areas respectively. System performance in terms of the error probability is explored.

Also, a computer modelling and simulation is done for direct sequence spread spectrum for one user, and for direct sequence code division multiple access for multi-user, with the impairment as mentioned above.

Two techniques for the performance evaluation in computer simulation have been used, Monte Carlo simulator and an importance sampling techniques.

After the verification of simulation results with the obtained results of analytical model, the simulation model is extended with considering the up-link noise, in addition to the impairment taken in the analytical analysis. The obtained results are done for different up-link thermal noise (SNRu).

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