STUDY ON THE CHARACTERISTIC OF CODE-DIVISION MULTIPLE-ACCESS SYSTEM OVER FADING CHANNEL

張元輝、鍾翼能

E-mail: 9125194@mail.dyu.edu.tw

ABSTRACT

THE EFFECT IN SYSTEM PERFORMANCE INDUCED BY FADING CHANNEL FOR THE WIRELESS COMMUNICATI -ON SYSTEM, WHICH IS ADOPTED AS MAIN TECHNICAL FOR THE 3RD-GENERATION MOBILE COMMUNICATIO -N SYSTEM, IS VERY SIGNIFICANTLY.DUE TO THIS POINT, WE INVESTIGATE SOME OF THIS ISSUES FOL -LOW ABOUT MODULATION SCHEMES DETAIL IN THIS PAPER,IN WHICH WE MAINLY INVOLVE THE PERFORMA -NCE ANALYSIS FOR CDMA OPERATING IN CHANNEL FADING ENVIRONMENTS,SPECIFICALLY, THE CORRELAT -ION COEFFICIENT BETWEEN MULTIPATH WAS DISCUSSED.WE ARE NOT ONLY DERIVED THE NECESSARY VAR -IANCE FORMULAS INCLUDING IN EVERY KINDS OF INTERFERENCE,BUT THE PROBABILITY DENSITY FUNCT -ION (PDF) OF SIGNAL-TO-NOISE RATIO (SNR) ON THE OUTPUT OF THE RAKE RECEIVER ALSO OBTAINED .AT LAST,A NEW CLOSED FORM FOR AVERAGE BIT ERROR RATE ABOUT THE FACT OF EFFECTIVE OF PROCE -SSING GAIN, USER NUMBER,AVERAGE POWER DECAY RATE,AND DIVERSITY BRANCH NUMBER FOR CDMA WAS DERIVED. IT IS ALSO PROVED BY MEANS OF THE NUMERICAL RESULTS.

Keywords : fading channel ; code-division multiple-access (CDMA) ; statistical distribution ; RAKE receiver.

Table of Contents

REFERENCES

1.B.SKLAR,"RAYLEIGH FADING CHANNELS IN MOBILE DIGITAL COMMUNICATION SYSTEMS PART I: CHARA -CTERIZATION,"IEEE COMMUNICATION MAGAZINE, VOL.35, NO.7, PP. 90-100, JULY 1997. 3.T.S.RAPPAPORT,WIRELESS COMMUNICATIONS,UPPER SADDLE RIVER, NJ: PRENTICE HALL 1996. 4.H.H.SEUNG,ET AL."A CHANNEL MODEL FOR NONGEOSTATIONARY ORBITING SATELLITE SYSTEM,"IEEE V -EH.TECHNOL.CONFERENCE,47TH VOL.1, PP. 41-45 MAY 1997. 5.C.LOO AND N.SECORD"COMPUTER MODELS FOR FADING CHANNELS WITH APPLICATION TO DIGITAL TRAN -SMISSION,"IEEE TRANS. VEH.TECHNOL.,VOL.VT-40, PP. 700-707,NOV.1991. 6.R.PRASAD,H.S.MISSER,AND A.KEGEL,"PERFORMANCE ANALYSIS OF DIRECT SEQUENCE SPREAD SPECTRU -M MULTIPLE ACCESS COMMUNICATION IN AN INDOOR RICIAN FADING CHANNELS WITH DPSK MODULAT -ION,"ELECTRONICS LETTERS,VOL.26,PP.1366-1367,SEP.1990. 7.T.T.TJHUNG,AND C.C.CHAI,"FADE STATISTICS IN MICROCELLULAR MOBILE RADIO CHANNELS WITH SH -ADOWING,"ICC 98.,VOL.3, PP.1645-1649 1998. 8.C.LOO,"STATISTICAL MODEL FOR A LAND MOBILE SATELLITE LINK,"IEEE TRANS.ON VEHICULAR TECH -NOLOGY,VT-34,NO.3.PP.122-127,AUG.1985. 9.CORAZZA,AND F.VATALARO,"A STATISTICIAL MODEL FOR LAND MOBILE SATELLITE CHANNELS AND ITS APPLICATION TO NONGEOSTATIONARY ORBIT SYSTEMS,"IEEE TRANS.VEH.TECHNOL.,VOL.VT-43,PP.738 -742.AUG.1994. 10.H.SUZUKI,"A STATISTICAL MODEL FOR URBAN RADIO PROPAGATION,"IEEE TRANS.ON COMMUN.,VOL.CO -M-27, NO.4,PP.657-670,APR.1979. 11.B.SKLAR,"RAYLEIGH FADING CHANNELS IN MOBILE DIGITAL COMMUNICATION SYSTEMS PART II: MITI -GATION,"IEEE COMMUNICATION MAGAZINE,VOL.35, NO.7, PP.102-109,JULY 1997. 12.J.G.PROAKIS,DIGITAL COMMUNICATIONS,MCGRAW-HILL,INC. 1995. 13.A.J.VITERBI,CDMA:PRINCIPLES OF SPREAD SPECTRUM

COMMUNICATION.READING,MA:ADDISON-WESLEY, 1995. 14.G.TURIN,F.CLAPP,T.JOHNSTON,S.FINE,AND D.LAVRY,"A STATISTICAL MODEL OF URBAN MULTIPATH P -ROGATION,"IEEE TRANS. VEH. TECHNOL.,VOL.VT-21,NO.1,PP.1-9,1972. 15.N.H.L.CHAN AND P.T.MATHIOPOULOS,"EFFICIENT VIDEO TRANSMISSION OVER CORRELATED NAKAGAMI FADING CHANNELS FOR IS-95 CDMA SYSTEMS",IEEE J.SELECT.AREA COMMUN,18 (6) PP.996-1011, JUNE 2000. 16.J.N.PIERCE AND S.STEIN,"MULTIPLE DIVERSITY WITH NONINDEPENDENT FADING",PROC.IRE 48 PP. 89-104 JAN.1960. 17.M.S.ALOUINI,A.ABDI,AND M.KAVEH,"SUM OF GAMMA VARIATES AND PERFORMANCE OF WIRELESS COMMU -NICATION SYSTEMS OVER NAKAGAMI-FADING CHANNELS,"IEEE TRANS.VEHICULAR TECH.VOL.50,NO.6, NOV. 2001.