

Nasir Ganikhodjaev
Farrukh Mukhamedov
Pah Chin Hee

VOLUME 1

$$x' = 2xy$$

$$y' = 2xz$$

INVESTIGATIONS ON PURE MATHEMATICS, FINANCE MATHEMATICS AND OPTICS

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$$\varphi_1(x, y, z) = z$$

$$\pi_1 = \begin{pmatrix} x & y & z \\ y & z & x \end{pmatrix}$$

$$z' = x^2 + y^2 + z^2 + 2yz$$

$$\pi_1 \nu_1 \pi_1 = \nu_{17}$$



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Investigations on Pure Mathematics, Finance Mathematics and Optics

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Contents

Preface

Part I Pure Mathematics Concentration

Chapter 1	THE BEHAVIOR OF TRAJECTORY OF ξ^s QUADRATIC STOCHASTIC OPERATIONS	2
Chapter 2	THEORY OF MARKOV CHAINS IN PEDIATRIC DISEASES	8
Chapter 3	ON NONLINEAR DYNAMIC SYSTEMS ARISING IN POTTS MODEL	14
Chapter 4	THE FIRST RETURN TIME AND DIMENSION	22
Chapter 5	ON AS SOCIATIVE ALGEBRAIC STRUCTURE OF GENETIC INHERITANCE	31
Chapter 6	INTERACTING PARTICLE SYSTEM	37
Chapter 7	DYNAMICS OF GENERALIZED LOGISTIC MAPS	43
Chapter 8	GEOMETRIC BROWNIAN MOTION AND CALCULATION OF OPTION PREMIUM IN BLACK-SCHOLES MODEL	50
Chapter 9	ON THE ELEMENTARY CHARACTERIZATION OF PRIMES IN PRIMALITY TESTS: TWO SHORT STUDIES.	57
Chapter 10	ON ASSOCIATIVE ALGEBRAIC STRUCTURE OF GENETIC INHERITANCE	64
Chapter 11	SOME APPLICATION OF ERGODIC THEORY IN NUMBER THEORY	70
Chapter 12	STUDY OF ROLES OF EXTERNAL MAGNETIC FIELD ON ISING AND POTTS MODEL	76
Chapter 13	INVESTIGATION OF STABILITY OF FIXED POINTS OF NONLINEAR DISCRETE DYNAMICAL SYSTEMS	82
Chapter 14	MARKOV CHAINS AND ITS APPLICATION: THE INVENTORY MODEL	90
Chapter 15	PHASE TRANSITION FOR ISING MODEL WITH TWO COMPETING INTERACTION ON CAYLEY TREE OF ORDER 4	96
Chapter 16	LIMIT BEHAVIOR OF DYNAMIC SYSTEMS CORRESPONDING TO LATTICE MODELS WITH COMPETING PROLONGED AND ONE-LEVEL BINARY INTERACTIONS	101
Chapter 17	ASSOCIATIVE ALGEBRA IN GENETIC INHERITANCE	109
Chapter 18	ON ξ^a -QUADRATIC STOCHASTIC OPERATORS AND THEIR CLASSIFICATIONS	115

Part II Finance Mathematics Concentration

Chapter 19	ANALYZING THE PERFORMANCE OF INVESTMENT STRATEGY OF EPF	123
Chapter 20	PREDICTION OF STOCK PRICE USING NEURAL NETWORK	130
Chapter 21	COMPARISON BETWEEN CONVENTIONAL AND ISLAMIC BOND IN MALAYSIA	136
Chapter 22	STOCK PERFORMANCE ANALYSIS BETWEEN MALAYSIAN AIRLINES SYSTEM BERHAD AND AIRASIA BERHAD	144
Chapter 23	ISLAMIC PAWNBROKING (AR-RAHNU) AS A MICRO CREDIT INSTRUMENT IN MALAYSIA	151
Chapter 24	ANALYSIS OF CRUDE PALM OIL FUTURES PRICES TRADED ON BURSA MALAYSIA	160
Chapter 25	AN EMPIRICAL STUDY ON THE EFFICIENCY OF THE TRIM AND FILL METHOD IN CORRECTING PUBLICATION BIAS IN META ANALYSIS	166
Chapter 26	PERFORMANCE ANALYSIS OF INSURANCE AND TAKAFUL INDUSTRIES IN MALAYSIA	171
Chapter 27	ANALYSIS OF DATA USING MULTILEVEL MODELLING WITH MLwiN	179
Chapter 28	FINANCIAL PERFORMANCE OF ISLAMIC BANKING AND CONVENTIONAL BANKING IN MALAYSIA	186
Chapter 29	A STUDY ON THE EFFECT OF PUBLICATION BIAS IN META ANALYSIS	194
Chapter 30	RATIO ANALYSIS: BANK ISLAM MALAYSIA BERHAD (BIMB) & MALAYAN BANKING BERHAD (MAYBANK)	201
Chapter 31	AN ANALYSIS OF MALAYSIAN UNIT TRUST FUNDS: ISLAMIC VS CONVENTIONAL	207

Part III Optics Concentration

Chapter 32	QUANTUM TRAJECTORY METHOD USING MPI PARALLEL COMPUTING	214
Chapter 33	LINEAR WAVE PROPAGATION IN SINGLE MODE OPTICAL FIBRE	220
Chapter 34	THE OPTICAL RAY TRACING TECHNIQUE IN LENS SYSTEM WITHIN AND BEYOND PARAXIAL APPROXIMATION	226
Chapter 35	WAVE PROPAGATION IN NONLINEAR AND HOMOGENEOUS MEDIA: KERR MEDIA	234
Chapter 36	MATRIX METHODS OF OPTICAL RESONATORS	240

INVESTIGATION OF STABILITY OF FIXED POINTS OF NONLINEAR DISCRETE DYNAMICAL SYSTEMS

Nor Halimatun Mohd Halid
Assist. Prof. Dr. Pah Chin Hee

Abstract. *This project paper examines the nonlinear recurrent equation of discrete dynamical systems which are obtained from the problem on Cayley tree of order 2 and 3 to verify the analytical critical curve by using numerical method. The existence of phase transitions is investigated by studying the number of fixed point and the stability of the fixed points is investigated. It is found that the numerical result is in strong agreement with the analytic one for Cayley tree of order 2. While an error in analytic result for order 3 is reported, a correct formula is produced.*

1 Study on a nonlinear Discrete Dynamical System of Cayley tree order 2

1.1 The existence of phase transitions

In this project paper, we discuss about the curves separately. First, let consider ferromagnetic case. The curve is shown in figure 1.1.

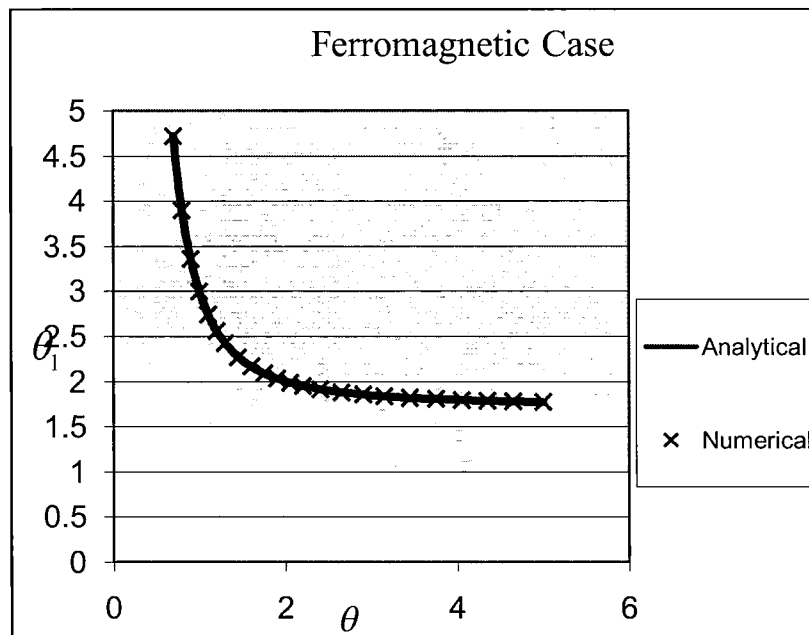


Figure 1.1. The numerical and analytical curve $\theta^* = \frac{1 + \sqrt{1 + 3\theta^4}}{\theta^2}$ in the plane (θ, θ_1) .

The numerical curve is in agreement with the analytical curve. Ganikhodjaev, Pah and Wahiddin (2003) stated that, there are three positive different fixed points, u_1^* , $u_2^* = 1$, and u_3^* for each pair of parameter (θ, θ_1) above the critical curve. The equation also has only a single fixed point $u^* = 1$ for other pairs of parameter (θ, θ_1) which are situated on or below the