LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : PROSIDING INTERNASIONAL

Judul Prosiding (Artikel)	:	Applied Drazin Inverse to Moore-Penrose inverse in rings with involution
Nama/ Jumlah Penulis	:	U Tarmizi, T Udjiani SRRM, **Susilo Hariyanto**, Harjito, F A Mansuri
Status Pengusul	:	penulis ke-3
Identitas Prosiding	:	a. Nama Prosiding : Journal of Physics: Conference Series
		b. Nomor ISSN : Online ISSN: 1742-6596 Print ISSN: 1742-6588
		c. Vol, No., Bln Thn : 1217 012069 (2019)
		d. Penerbit : IOP Publishing
		e. DOI artikel (jika ada) : 10.1088/1742-6596/1217/1/012069
		f. Alamat web penerbit : https://iopscience.iop.org/article/10.1088/1742-6596/1217/1/012069
		g. Terindex : Scopus

Kategori Publikasi Prosiding (beri ✓pada kategori yang tepat) :
- [√] Prosiding Internasional terindek pada scimagojr dan scopus
- [ ] Prosiding Internasional terindek scopus, IEEE Eexplore
- [ ] Prosiding Nasional

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Reviewer		Nilai Rata-Rata
	Reviewer 1	Reviewer 2	
a. Kelengkapan unsur isi Prosiding (10%)	2,9	2,9	2,9
b. Ruang lingkup dan kedalaman pembahasan (30%)	8,6	8,95	8,775
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	8,5	8,925	8,7125
d. Kelengkapan unsur dan kualitas terbitan/ Prosiding (30%)	8,5	8,975	8,7375
Total = (100%)	**28,5**	**29,75**	**29,125**
Nilai Pengusul = 40%/4 x 29,125 = 2,9125			

Semarang,

Reviewer 1	Reviewer 2
Nama : Prof. Dr. Sunarsih, M.Si	Nama : Drs. Bayu Surarso, M.Sc Ph.D
NIP. 195809011986032002	NIP. 19631105 198803 1 001
Unit Kerja : FSM Undip	Unit Kerja : FSM Undip
Bidang Ilmu: Matematika	Bidang Ilmu: Matematika

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : PROSIDING INTERNASIONAL

Judul Prosiding (Artikel)	:	Applied Drazin Inverse to Moore-Penrose inverse in rings with involution			
Nama/ Jumlah Penulis	:	U Tarmizi, T Udjiani SRRM, **Susilo Hariyanto**, Harjito, F A Mansuri			
Status Pengusul	:	penulis ke-3			
Identitas Prosiding	:	a.	Nama Prosiding	:	Journal of Physics: Conference Series
		b.	Nomor ISSN	:	Online ISSN: 1742-6596 Print ISSN: 1742-6588
		c.	Vol, No., Bln Thn	:	1217 012069 (2019)
		d.	Penerbit	:	IOP Publishing
		e.	DOI artikel (jika ada)	:	10.1088/1742-6596/1217/1/012069
		f.	Alamat web penerbit	:	https://iopscience.iop.org/article/10.1088/1742-6596/1217/1/012069
		g.	Terindex	:	Scopus

Kategori Publikasi Prosiding (beri ✓pada kategori yang tepat) :
- [√] Prosiding Internasional terindek pada scimagojr dan scopus
- [ ] Prosiding Internasional terindek scopus, IEEE Eexplore
- [ ] Prosiding Nasional

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal prosiding: Internasional terindek Smimagojr &scopus (30)	Nilai Maksimal prosiding: Internasioan scopus IEEE	Nilai Maksimal prosiding: Nasional	Nilai Akhir Yang Diperoleh
a. Kelengkapan unsur isi Prosiding (10%)	3			2,9
b. Ruang lingkup dan kedalaman pembahasan (30%)	9			8,6
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	9			8,5
d. Kelengkapan unsur dan kualitas terbitan/ Prosiding (30%)	9			8,5
Total = (100%)				**28,5**
Nilai Pengusul = 40%/4 x 28,5 = 2,85				

Catatan Penilaian artikel oleh Reviewer :

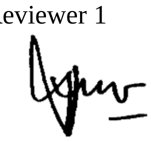
1. **Kesesuaian dan kelengkapan unsur isi prosiding:**
   Unsur dalam artikel baik. Kesesuaian dengan bidang kajian ilmu matematika juga baik.

2. **Ruang lingkup dan kedalaman pembahasan:**
   Topik yang dikaji merupakan topik matematika bidang aljabar. Tingkat kedalamannya baik.

3. **Kecukupan dan kemutakhiran data/informasi dan metodologi:**
   Merupakan bahan kajian baru, sehingga artikel ini memiliki nilai orisinil dan kertebaruan dengan didukung 5 referensi yang out of date berupa teks books, karena kajian teori.

4. **Kelengkapan unsur dan kualitas terbitan:**
   Unsur dan kualitas terbitan Baik. Publikasi di prosiding terindek dengan similarity 16%

Semarang, 4 Maret 2023
Reviewer 1



Nama : Prof. Dr. Sunarsih, M.Si
NIP. : 195809011986032002
Unit Kerja : FSM Undip
Bidang Ilmu: Matematika

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : PROSIDING INTERNASIONAL

Judul Prosiding (Artikel)	:	Applied Drazin Inverse to Moore-Penrose inverse in rings with involution			
Nama/ Jumlah Penulis	:	U Tarmizi, T Udjiani SRRM, **Susilo Hariyanto**, Harjito, F A Mansuri			
Status Pengusul	:	penulis ke-3			
Identitas Prosiding	:	a.	Nama Prosiding	:	Journal of Physics: Conference Series
		b.	Nomor ISSN	:	Online ISSN: 1742-6596 Print ISSN: 1742-6588
		c.	Vol, No., Bln Thn	:	1217 012069 (2019)
		d.	Penerbit	:	IOP Publishing
		e.	DOI artikel (jika ada)	:	10.1088/1742-6596/1217/1/012069
		f.	Alamat web penerbit	:	https://iopscience.iop.org/article/10.1088/1742-6596/1217/1/012069
		g.	Terindex	:	Scopus

Kategori Publikasi Prosiding (beri ✓pada kategori yang tepat) :
- [√] Prosiding Internasional terindek pada scimagojr dan scopus
- [ ] Prosiding Internasional terindek scopus, IEEE Eexplore
- [ ] Prosiding Nasional

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal prosiding			Nilai Akhir Yang Diperoleh
	Internasional terindek Smimagojr &scopus [30]	Internasioan scopus IEEE [ ]	Nasional [ ]	
a. Kelengkapan unsur isi Prosiding (10%)	3			2,9
b. Ruang lingkup dan kedalaman pembahasan (30%)	9			8,95
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	9			8,925
d. Kelengkapan unsur dan kualitas terbitan/ Prosiding (30%)	9			8,975
Total = (100%)				**29,75**
Nilai Pengusul = (40/4)% x 29,75 = 2,975				

Catatan Penilaian artikel oleh Reviewer :

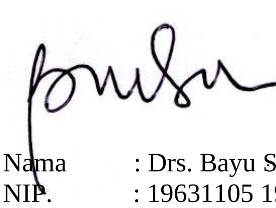
1. <u>Kesesuaian dan kelengkapan unsur isi prosiding:</u>
Unsur isi sesuai dengan yang dijabarkan di abstrak. Kelengkapan dari bagian-bagian artikel juga sesuai dan baik. Metodologi tidak disampaikan secara eksplisit

2. <u>Ruang lingkup dan kedalaman pembahasan:</u>
Ruang lingkup artikel ini tentang aljabar linier matrik yakni membahah tentang invers secra umum. Kedalamannya pembahsan artikel ini baik.

3. <u>Kecukupan dan kemutakhiran data/informasi dan metodologi:</u>
Metodologi yang digunakan dengan kajian literatur yakni dengan mempelajari artikel artikel yang topiknya bersesuaian. Kajiannya memenuhi nilai kemutakhiran yang cukup baik. Artikel didukung dengan 5 buah artikel sebagai referensi

4. <u>Kelengkapan unsur dan kualitas terbitan:</u>
Terbitan baik dan unsurnya lengkap. Artikel ini telah memenuhi standar publis di IOP. Hasil uji similaritas dengan turnitin juga baik, sebesar 16%.

Semarang, Februari 2023
Reviewer 2



Nama : Drs. Bayu Surarso, M.Sc Ph.D
NIP. : 19631105 198803 1 001
Unit Kerja : FSM Undip
Bidang Ilmu: Matematika

Journal of Physics: Conference Series • *Open Access* • Volume 1217, Issue 1 • 17 June 2019 • Article number 12069 • 8th International Seminar on New Paradigm and Innovation on Natural Sciences and Its Application, ISNPINSA 2018 • Semarang, Central Java • 26 September 2018 • Code 148936

Document type
Conference Paper • *Gold Open Access*

Source type
Conference Proceedings

ISSN
17426588

DOI
10.1088/1742-6596/1217/1/012069

View more

Applied drazin inverse to moore-penrose inverse in rings with involution

Tarmizi U.; Udjiani Srrm T.; Hariyanto S.; Harjito; Mansuri F.A.

Save all to author list

[a] Department of Mathematics, Faculty of Science and Mathematics, Diponegoro University, Semarang, 50275, Indonesia

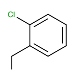
Abstract

Moore-Penrose inverse is one of development of generalized inverse. In this paper, we defined and studied a relation between the Moore-Penrose inverse and the Drazin inverse in the setting of rings with involution. The results of this paper are new characterizations of Moore-Penrose inverse by applying Drazin inverse with an algebraic proof. © Published under licence by IOP Publishing Ltd.

Reaxys Chemistry database information

Substances

View all substances (1)



Scopus

Source details

Journal of Physics: Conference Series

CiteScore 2021
0.8

Scopus coverage years: from 2005 to Present

ISSN: 1742-6588 E-ISSN: 1742-6596

Subject area: Physics and Astronomy: General Physics and Astronomy

Source type: Conference Proceeding

SJR 2021
0.210

View all documents > Set document alert Save to source list Source Homepage

SNIP 2021
0.395

CiteScore CiteScore rank & trend Scopus content coverage

i Improved CiteScore methodology

CiteScore 2021 counts the citations received in 2018-2021 to articles, reviews, conference papers, book chapters and data papers published in 2018-2021, and divides this by the number of publications published in 2018-2021. Learn more >

CiteScore 2021

0.8 = 74,925 Citations 2018 - 2021 / 96,702 Documents 2018 - 2021

Calculated on 05 May, 2022

CiteScoreTracker 2022

0.9 = 87,675 Citations to date / 95,266 Documents to date

Last updated on 05 February, 2023 • Updated monthly

CiteScore rank 2021

Category	Rank	Percentile
Physics and Astronomy — General Physics and Astronomy	#195/240	18th

View CiteScore methodology > CiteScore FAQ > Add CiteScore to your site

The open access *Journal of Physics: Conference Series (JPCS)* provides a fast, versatile and cost-effective proceedings publication service.

Latest published conferences

Vol 2448 Go

Conference archive

2023 Go

View forthcoming volumes accepted for publication.

If you would like more detailed information regarding *Journal of Physics: Conference Series* please visit conferenceseries.iop.org, and if you are interested in publishing a proceedings with IOP Conference Series please visit our page for conference organizers.

Conference organizers can use our online form and we will get in touch with a quote and further details.

Most read

Latest articles

JOURNAL LINKS

Journal home

Journal Scope

Information for organizers

Information for authors

PAPER • **OPEN ACCESS**

The 8th International Seminar on New Paradigm and Innovation on Natural Science and Its Application

To cite this article: 2019 *J. Phys.: Conf. Ser.* **1217** 011001

IOP Conf. Series: Journal of Physics: Conf. Series **1217** (2019) 011001 doi:10.1088/1742-6596/1217/1/011001

PREFACE

The 8th International Seminar on New Paradigm and Innovation on Natural Sciences and Its Application (ISNPINSA-8) is annual seminars organized by Faculty of Sciences and Mathematics (FSM) Diponegoro University and has been successfully conducted since 2011. The ISNPINSA-8 was held in Semarang, Indonesia on September 26th 2018. The aims of ISNPINSA are to facilitate brain storming and state of the art information in field of sciences and mathematics; to increase innovation of technology that can be applied in industries; to contribute in formulating strategy to increase the role of science for community; and to stimulate collaboration between industries, researchers and government to increase community welfare. The theme of 8th ISNPINSA in 2018 is "*Science and Applied Science for Sustainable Development Goals*".

The number of participants of the seminar were 272 including keynote speakers, invited speakers, oral presenters, poster presenters, and non presenters coming from various institutions of various countries, including Japan, Philippines, Thailand, Malaysia, Australia, Bangladesh, China, Kazakhtan, Vietnam and those who come from all parts of Indonesia consist of researchers, lecturers, postgraduate and undergraduate students from various universities. There are 272 papers were presented in this seminar, consist of 5 keynote speakers, 237 oral presentations, and 30 poster presentations. After the selection process, there are 184 articles selected papers to be published in the present conference proceeding. This is the largest number of papers and participants for eight times the implementation of ISNPINSA. The scope of the field of participants comes from various fields including biology, physics, chemistry, statistics, mathematics, informatics, environment, public health, and relevant fields that contribute to sustainable development.

The Editors

Dr.Eng. Ali Khumaeni
Sapto Purnomo Putro, Ph.D.
Rully Rahadian, Ph.D.

IOP Conf. Series: Journal of Physics: Conf. Series **1217** (2019) 011001 doi:10.1088/1742-6596/1217/1/011001

LIST OF REFEREES AND EDITORS

1. Prof. Dr. Widowati
2. Prof. Mustafid, Ph.D.
3. Prof. Dr. Wahyu Setia Budi
4. Prof. Dr. Heri Sutanto
5. Sapto P Putro, Ph.D.
6. Dr. Jafron W. Hidayat
7. Dr. Munifatul Izzati
8. Dr. Budi Warsito
9. Dr. Eng. Ali Khumaeni
10. Dr. Di Asih I Maruddani
11. Dr. Muhammad Nur, DEA
12. Dr. Kusworo Adi
13. Dr. Endang Kusdiyantini, DEA
14. Rully Rahadian, Ph.D.
15. Anto Budiharjo, Ph.D.
16. Dr. Tri Retnaningsih Soeprobowati
17. Ismiyarto, Ph.D.
18. Dr. Retno Ariadi Lusiana
19. Dr. Tarno
20. Dr. Eng. Adi Wibowo
21. Dr. Sutimin
22. Alan Prahutama, M.Si
23. Dr. Rukun Santoso
24. Dr. Redemtus Heru Tjahyana
25. Dinar Mutiara Kusumo Nugraheni, Ph.D.
26. Dr. Titik Widiharih
27. Dr. Hermin Pancasakti
28. Dr. Agung janika Sitasiwi
29. Dr. Erma Prihastanti
30. Heri Sugito, M.Si.
31. Fajar Ariyanto, M.Si.
32. Dr. Udi Harmoko
33. Dr. Rahmat Gernowo

IOP Conf. Series: Journal of Physics: Conf. Series **1217** (2019) 011001 doi:10.1088/1742-6596/1217/1/011001

LIST OF SPEAKER

Keynote Speaker:

Prof. Elmer S. Estacio, Ph.D.	National Institute of Phyics, University of the Philippines, Manila, Philippines
Prof. Dr. Kazuyoshi Kurihara	University of Fukui, Japan
Prof. Dr. Kaemwich Jantama, Ph.D.	Suranaree University of Technology, Thailand
Prof. Dr. Hendrik Heijnis	Australian Nuclear Science and Technology, Australia
Prof. Dr. I Gede Wenten	Institut Teknologi Bandung, Indonesia

Invited Speaker:

Dr. Retno Kusumaningrum	Diponegoro University, Semarang, Indonesia
Dr. Sutimin	Diponegoro University, Semarang, Indonesia
Prof. Dr. Heri Sutanto	Diponegoro University, Semarang, Indonesia
Vincensius Gunawan, Ph.D.	Diponegoro University, Semarang, Indonesia
Rully Rahadian, Ph.D.	Diponegoro University, Semarang, Indonesia
Dr.rer.nat. Anto Budiharjo	Diponegoro University, Semarang, Indonesia
Pratama Jujur Wibawa, Ph.D.	Diponegoro University, Semarang, Indonesia
Dr. Nor Basid Prasetya	Diponegoro University, Semarang, Indonesia
Dr. Rukun Santoso	Diponegoro University, Semarang, Indonesia

IOP Conf. Series: Journal of Physics: Conf. Series **1217** (2019) 011001 doi:10.1088/1742-6596/1217/1/011001

LIST OF COMMITTEE

Steering Committee:
Prof. Dr. Muhammad Zainuri, *Diponegoro University, Indonesia*
Prof. Dr. Widowati, *Diponegoro University, Indonesia*
Prof. Dr. Heru Susanto, *Diponegoro University, Indonesia*
Dr. Muhammad Nur, *Diponegoro University, Indonesia*
Prof. Dr. Wahyu Setia Budi, *Diponegoro University, Indonesia*
Prof. Dr. Mustafid, *Diponegoro University, Indonesia*
Sapto Purnomo P, Ph.D, *Diponegoro University, Indonesia*

Organising Committee:
Dr.Eng. Ali Khumaeni, S.Si. M.E. (Chairman)
Rully Rahadian, SSi, MSi, PhD (Vice-Chairman I)
Dr. Di Asih I Maruddani, S.Si, M.Si (Vice-Chairman II)
Dr. R. Heru Tjahjana (Member)
Dr. Tarno, M.Si (Member)
Dr. Susilo Haryanto (Member)
Yayuk Astuti, Ph.D (Member)
Adi Darmawan, Ph.D (Member)
Agus Setyo Utomo, M.M (Member)
Dewi Kusrini, M.Si. (Member)
Dr. Kusworo Adi, M.T (Member)
Dr. Dwi Hadiyanti, M.Si (Member)
Dr. Endah D Hastuti, M.Si (Member)
Farikhin, Ph.D (Member)
Ragil Saputro, M.T (Member)
Dra. Dwi Ispriyanti, M.Si (Member)
Heri Sugito, M.Sc (Member)
Alan Prahutama, M.Si (Member)
Fajar Arianto, M.Si (Member)
Bagus Rahmawan Trianto, S.Kom (Member)
Alik Maulidiyah, S.Si (Member)

Table of contents

Volume 1217

2019

Previous issue   Next issue

The 8th International Seminar on New Paradigm and Innovation on Natural Science and Its Application 26 September 2018, Central Java, Indonesia

Accepted papers received: 27 March 2019

Published online: 18 June 2019

Open all abstracts

Preface

OPEN ACCESS 011001

The 8th International Seminar on New Paradigm and Innovation on Natural Science and Its Application

+ Open abstract   View article   PDF

OPEN ACCESS 011002

Peer review statement

+ Open abstract   View article   PDF

Papers

OPEN ACCESS 012001

2D electrical resistivity imaging based on backpropagation artificial neural network

A Setyawan, M S Fikri, J E Suseno and Najib

+ Open abstract   View article   PDF

OPEN ACCESS 012002

Application of waste water treatment technology from exhaust electroplating and anodizing process using electro-coagulation method

S S Rahayu, V S A Budiarti, B Sumiyarso, A Amrul and E Triyono

+ Open abstract   View article   PDF

OPEN ACCESS

On clean neutrosophic rings

Suryoto, Harjito and T Udjiani SRRM

+ Open abstract View article PDF

OPEN ACCESS 012067

Normal elements on the generalized moore penrose inverse

T Udjiani SRRM, S Zaki, Suryoto and Harjito

+ Open abstract View article PDF

OPEN ACCESS 012068

The characteristics of the Moore-Penrose inverse using the Drazin inverse

F A Mansuri, T Udjiani SRRM, Sutimin, Suryoto and U Tarmizi

+ Open abstract View article PDF

OPEN ACCESS 012069

Applied Drazin Inverse to Moore-Penrose inverse in rings with involution

U Tarmizi, T Udjiani SRRM, S Hariyanto, Harjito and F A Mansuri

+ Open abstract View article PDF

OPEN ACCESS 012070

Subspace of $M_n(\mathbb{Z}_2)$

Yanita and A Adrianda

+ Open abstract View article PDF

OPEN ACCESS 012071

Tuberculosis transmission with relapse in Indonesia: susceptible vaccinated infected recovered model

P Widyaningsih, A A Nugroho, D R S Saputro and Sutanto

+ Open abstract View article PDF

OPEN ACCESS 012072

Linear Programming with Fuzzy Variable Method for Solving Wastewater Treatment Plant (WWTP) Problem

T R Pratiwi, Sunarsih and B Surarso

+ Open abstract View article PDF

OPEN ACCESS 012073

A combination of Rivest Shamir Adlemann (RSA) and Affine Cipher method on improvement of the effectiveness and security of text message

IOP Conf. Series: Journal of Physics: Conf. Series **1217** (2019) 012003 doi:10.1088/1742-6596/1217/1/012003

Growth and fabrication of 850 nm AlGaAs/GaAs vertical cavity surface emitting laser structure

N I Cabello*, P M Tingzon, H A Husay, J D Vasquez, R Jagus, K L Patrocenio, K C Gonzales, G A Catindig, E A Prieto, A Somintac, A Salvador and E Estacio

National Institute of Physics, College of Science, University of the Philippines
NIP Bldg, National Science Complex, Diliman, Quezon City 1101, Philippines
E-mail: ncabello@nip.upd.edu.ph

Abstract. In this work, we demonstrate the NIP's all in-house development of a vertical cavity surface emitting laser structure. The VCSEL structure grown via MBE consists of an AlAs/AlGaAs distributed Bragg reflector and an AlGaAs/GaAs quantum well designed to issue at the 850 nm region. Reflectance spectroscopy showed that the stop band is centered around the designed wavelength. The electroluminescence spectra displayed that the maximum light emission corresponded to its design. This is a crucial step in the NIP's development of semiconductor lasers, leading towards future high-speed and highly-tunable VCSEL devices.

1. Introduction

Semiconductor lasers have been at the forefront of high-speed interconnects, thanks to the development of lasers capable of operating at gigahertz speeds [1]. Expansion to other applications such as proximity sensing [2] and light detection and ranging (LIDAR) [3] have driven further research on this field. For high-speed devices, switching speeds at the gigahertz range are desired [1], while high tuning speeds and increased tunability are sought for wavelength-tunable devices [4]. With its molecular beam epitaxy (MBE) and device fabrication facilities, the National Institute of Physics (NIP) has recently renewed its research thrust in this field, most notably on vertical cavity surface emitting lasers (VCSELs).

The VCSEL is a type of semiconductor laser with light emission orthogonal to the wafer plane. Its main advantages over other conventional semiconductor lasers such as edge-emitting lasers are the ease of coupling to optical fibers, direct wafer scale probing and low threshold operation [5]. A standard VCSEL design is composed of an optical cavity with an active region in the center, which is usually a quantum well (QW). The optical cavity is then sandwiched between two distributed Bragg reflectors (DBRs), which are highly reflecting mirrors composed of alternating high and low refractive index medium materials. The stop band of the DBR, which is the wavelength region with the highest reflectance, should coincide with the QW emission wavelength. Oxidation apertures, usually situated near the active region, are also employed for optical and current confinement [6].

In this paper, we report on the all in-house development of an AlGaAs/GaAs-based DBR VCSEL structure at the chip level. The whole process entails the whole production processes: the growth of the layers, device fabrication, and characterization of both as-grown and device-fabricated layers. Oxidation was also performed to explore the possibility of current and optical confinement effects [6].

2. Experimental Details

Analysis of non-Newtonian lubricated textured contact for mixed slip/no-slip configuration considering cavitation

A W Pratomo[1,2], Muhammad[3], M Tauviqirrahman[1], J Jamari[1] and A P Bayuseno[1]

[1]Department of Mechanical Engineering, Faculty of Engineering, University of Diponegoro
Jl. Prof. Soedarto, SH, Tembalang, Semarang 50275, Indonesia
[2]Department of Mechanical Engineering, State Polytechnic of Semarang
Jl. Prof. Soedarto, SH, Tembalang, Semarang 50275, Indonesia
[3]Laboratory for Surface Technology and Tribology, Faculty of Engineering Technology, University of Twente
Drienerloolan 5, Postbox 217, 7500 AE, Enschede, the Netherlands
E-mail: ariawanwhp@yahoo.co.id

Abstract. The increasing use of non-Newtonian fluids as lubricants has received much attention due to their high shear. The present study explores a lubrication mechanism in lubricated textured contact for mixed slip/no-slip pattern considering cavitation. The effect of texturing depth on the bearing performance is also investigated. The numerical method based on commercial CFD (computational fluid dynamic) software is carried out to analyze the tribological characteristics (i.e., hydrodynamic pressure distribution) of lubricated textured contact. To model slip, the enhanced user-defined-function (UDF) in the FLUENT® package is developed. The analysis results show that giving textures as well as a slip to one of the parallel sliding surfaces can generate significant hydrodynamic pressure to affect the load support. The increase in the load support is also indicated by increasing the streamline recirculating flow. Besides, numerical results suggest that cavitation modeling has a significant effect on performance. Ignoring cavitation leads to less accurate results.

1. Introduction

The bearing has offered technological advances and has played an essential role in many relevant fields. However, the main problem limiting the development of the bearing extensively is friction and wear. To solve this problem, the use of artificial texture and slip is important in lubricated devices because of the benefits associated with load support and friction [1-2]. As a consequence of the development of modern machines, improved lubricant characteristics have received great attention. The researchers found the desired oil by adding some polymers to the Newtonian fluid, which in turn causes the fluid properties to be non-Newtonian. Experimental studies suggested that non-Newtonian fluids can improve lubrication performance in hydrodynamic bearing systems [3-4].

Recently, research on adding texture and slip on the bearings have been conducted by researchers [5-8]. Many researchers have also introduced an experimental work for the analysis of textured bearings with non-Newtonian lubricants [9-10]. In most existing studies, it is known that the width and/or height of texture and slip can increase the load and reduce friction. However, the consequence of growing load support causes changes in film thickness, causing changes in pressure on

IOP Conf. Series: Journal of Physics: Conf. Series **1217** (2019) 012022 doi:10.1088/1742-6596/1217/1/012022

An investigation of a CT noise reduction using a modified of wiener filtering-edge detection

C Anam[1,*], T Fujibuchi[2], T Toyoda[2], N Sato[2], F Haryanto[3], R Widita[3], I Arif[3] and G Dougherty[4]

[1] Department of Physics, Faculty of Mathematics and Natural Sciences, Diponegoro University, Jl. Prof. Soedarto SH, Tembalang, Semarang 50275, Indonesia.
[2] Department of Health Sciences, Faculty of Medical Sciences, Kyushu University, 3-1-1 Maidashi, Higashi-ku, Fukuoka 812-8582, Japan.
[3] Department of Physics, Faculty of Mathematics and Natural Sciences, Bandung Institute of Technology, Ganesha 10, Bandung 40132, Indonesia.
[4] Applied Physics and Medical Imaging, California State University Channel Islands, Camarillo, CA 93012, USA.
E-mail: anam@fisika.undip.ac.id

Abstract. The aims of this study were to investigate the noise reduction in a CT image using a modified Wiener filtering-edge detection method. We modified the noise reduction algorithm of a combination of the Wiener filter and edge detection by addition of a dilation stage after edge detection. We then evaluated kernel size of the Wiener filter, threshold values in the edge detection, and size of structuring elements in the dilation process. Images of adult anthropomorphic and self-built wire phantoms were acquired by the new 4-row multislice CT Toshiba Alexion™. The images of the anthropomorphic phantom were used for a visual evaluation, while the images of the wire-phantom were used to obtain the spatial resolution and noise of the images. A Wiener filter-edge detection filter coupled with dilation, potentially reduced more CT noise. We found that the spatial resolution and noise of the filtered images were influenced by the size of the Wiener filter kernel, threshold of edge detection, and size of structuring element.

1. Introduction

Several approaches have been proposed to reduce CT dose without compromising image quality. One method has been proposed is the tube current modulation (TCM) [1, 2]. In TCM, tube currents decrease and increase proportionally with the decreasing and increasing attenuation of body parts [3]. Tube current modulation could be implemented by the rotation of the x-ray tube (angle-modulation) or by modulation in the direction of the longitudinal axis (Z-modulation), or a combination of both [4]. Another method proposed for reducing the dose is to utilize iterative reconstruction (IR) [5], instead of filtered back-projection (FBP). In fact, the IR technique is not only iterative during reconstruction but also iteratively processes in either the sinogram [6] or image spaces [7], in accordance with the specific physical modeling or statistical approaches. There are several IR software products used by major CT vendors including ASIR, AIDR, VEO, IRIS, SAFIRE, and iDose [8]. However, the details of the algorithms are very sparse, and they are still considered proprietary algorithms [5].

Another method that can be used for CT dose reduction is the use of noise reduction in the image space [8]. A noisy image due to acquisition with a small tube current-time (mAs) parameter can have

Applied Drazin Inverse to Moore-Penrose inverse in rings with involution

by Susilo Hariyanto

IOP Conf. Series: Journal of Physics: Conf. Series **1217** (2019) 012069 doi:10.1088/1742-6596/1217/1/012069

Applied Drazin Inverse to Moore-Penrose inverse in rings with involution

U Tarmizi[1,a], T Udjiani SRRM[1,2], S Hariyanto[1,2], Harjito[2] and F A Mansuri[1]

[1] Magister of Mathematics, Faculty of Science and Mathematics, Diponegoro University, Semarang 50275, Indonesia
[2] Department of Mathematics, Faculty of Science and Mathematics, Diponegoro University, Semarang 50275, Indonesia
[a)]E-mail: uzermagister@gmail.com

Abstract. Moore-Penrose inverse is one of development of generalized inverse. In this paper, we defined and studied a relation between the Moore-Penrose inverse and the Drazin inverse in the setting of rings with involution. The results of this paper are new characterizations of Moore-Penrose inverse by applying Drazin inverse with an algebraic proof.

1. Introduction

Moore-Penrose inverse was independently described by Moore (1920) and Penrose (1955). In numerical linear algebra, the Moore-Penrose inverse is commonly to find the matrix inverse of a singular matrix or rectangular matrix. Besides wide uses in the generalized matrix, Moore-Penrose inverse has also been applied in C*-algebras (Harte ,1992) , C*-crosses product (Hiroyuki Osaka, 1998) , and many more. Many types characteristic of Moore-Penrose Inverse has been found (Dragan S. Djordjevic, Pedro Particioa, etc.). At this paper, we aimed to develop characteristics Moore-Penrose inverse in symmetric elements by Drazin inverse.

The paper is motivated by Mosaic and Djordjevic [2]. It was reported Moore-Penrose inverse had several characteristics including $a^{\dagger}=\left(a^{*}a\right)^{\dagger}a^{*}=a^{*}\left(aa^{*}\right)^{\dagger}$ and $\left(a^{*}\right)^{\dagger}=a\left(a^{*}a\right)^{\dagger}=\left(aa^{*}\right)^{\dagger}a$ and $\left(aa^{*}a\right)^{\dagger}=a^{\dagger}\left(a^{*}\right)^{\dagger}a^{\dagger}$ that changed in the form of Drazin. Furthermore, the form of Drazin is applied to Moore-Penrose inverse with the symmetric rule.

Let R be a ring with identity and $a\in R$. An Involution "*" in a ring is a unary operation $a\to a^{*}$ such that :

$$\left(a^{*}\right)^{*}=a \qquad (ab)^{*}=b^{*}a^{*} \qquad (a+b)^{*}=a^{*}+b^{*}$$

for all elements $a,b\in R$. An element $a\in R$ satisfying $a=a^{*}$ is called Hermitian (or symmetric).

Let $a\in R$ is said to be Moore-Penrose (MP) invertible with respect to "$\dagger$" , if there exist $a^{\dagger}\in R$ such that :

$$aa^{\dagger}a=a \qquad a^{\dagger}aa^{\dagger}=a^{\dagger} \qquad \left(aa^{\dagger}\right)^{*}=aa^{\dagger} \qquad \left(a^{\dagger}a\right)^{*}=a^{\dagger}a$$

Also, the group inverse of $a\in R$ exists if there is a $a^{\#}\in R$ such that :

$$aa^{\#}a=a \qquad a^{\#}aa^{\#}=a \qquad aa^{\#}=a^{\#}a$$

IOP Conf. Series: Journal of Physics: Conf. Series **1217** (2019) 012069 doi:10.1088/1742-6596/1217/1/012069

If the group inverse exists then it is unique.

An element $a \in R$ is said to have a Drazin Inverse if there exists $a^D \in R$ such that

$$a^D a a^D = a^D \qquad a a^D = a^D a \qquad a^{k+1} a^D = a^k \text{ ,for some non-negative integer k}$$

If $a \in R$ has a Drazin Inverse, then the smallest possible non-negative integer involve in (3) is called the Drazin index of a.

As for group inverse and Moore-Penrose inverse, if the Drazin inverse exists then it is unique.

2. Applied Drazin Inverse

In this section, we construct several lemmas that used to apply Drazin inverse to Moore Penrose inverse. In the paper of Koliha and Patricio [1] in theorem 5.4 said that Moore-Penrose invertible symmetric element is Drazin inverse. Based on that theorem, we applied Drazin inverse to Moore Penrose inverse that produces new characteristics. Before we apply Drazin inverse to Moore-Penrose inverse, we constructed some properties about Drazin inverse. The following lemma constructed by applied symmetric theorem in Drazin inverse. [4]

Lemma 2.1 Let R be a ring with involution. If $a \in R^{\dagger}$ then $(a^D)^* = (a^*)^D$

Proof Let $a \in R^{\dagger}$, first

$$\left(a^D\right)^* a^* \left(a^D\right)^* = \left(a^D\right)^* \left(a^D a\right)^* = \left(a^D a a^D\right)^* = \left(a^D\right)^*,$$

second

$$a^* \left(a^D\right)^* = \left(a^D a\right)^* = \left(a a^D\right)^* = \left(a^D\right)^* a^*,$$

third

$$\left(a^{k+1}\right)^* \left(a^D\right)^* = \left(a^D a^{k+1}\right)^* = \left(a^{k+1} a^D\right)^* = \left(a^k\right)^*$$

We conclude that $(a^D)^* = (a^*)^D$ ■

The following theorem lemma presents a relation between Moore-Penrose inverse and Drazin inverse.

Theorem 2.2 [1] Let R be a ring with involution and $a \in R^{\dagger}$. If $a^* = a$, then $a^{\dagger} = a^D$.

Proof. Suppose $a \in R^{\dagger}$ and $a^* = a$, first

$$a a^D a = a a a^D = a^2 a^D = a$$

second

$$a^D a a^D = a^D$$

third

$$\left(a a^D\right)^* = \left(a^D\right)^* a^* = a^D a = a a^D$$

fourth

$$\left(a^D a\right)^* = a^* \left(a^D\right)^* = a a^D = a^D a$$

Because all of the Moore-Penrose rules has been satisfied, so we can conclude that $a^{\dagger} = a^D$, if $a^* = a$. ■

Futhermore, we are modifying theorem 2.2 became to lemma 2.3.

Lemma 2.3 Let R be a ring with involution. If $a \in R^{\dagger}$, then $\left(a^* a\right)^{\dagger} = \left(a^* a\right)^D$.

Proof. Let $a \in R^{\dagger}$, we get

$$a^* a \left(a^* a\right)^D a^* a = a^* a a^* \left(a^* a\right)^D a = a^* a a^* a \left(a^* a\right)^D = \left(a^* a\right)^2 \left(a^* a\right)^D = a^* a,$$

and

$$\left(a^* a\right)^D a^* a \left(a^* a\right)^D = \left(a^* a\right)^D,$$

also

$$\left(a^*a\left(a^*a\right)^D\right)^* = \left(\left(a^*a\right)^D\right)^*\left(a^*a\right)^* = \left(\left(a^*a\right)^*\right)^D\left(a^*a\right)^* = \left(a^*\left(a^*\right)^*\right)^D a^*\left(a^*\right)^* = \left(a^*a\right)^D a^*a$$
$$= a^*\left(a^*a\right)^D a = a^*a\left(a^*a\right)^D$$

furthermore

$$\left(\left(a^*a\right)^D a^*a\right)^* = \left(a^*a\right)^*\left(\left(a^*a\right)^D\right)^* = \left(a^*a\right)^*\left(\left(a^*a\right)^*\right)^D = a^*\left(a^*\right)^*\left(a^*\left(a^*\right)^*\right)^D = a^*a\left(a^*a\right)^D$$
$$= a^*\left(a^*a\right)^D a = \left(a^*a\right)^D a^*a$$

First rule, second rule, third rule, and fourth rule of Moore-Penrose inverse has been satisfied, we can conclude that $\left(a^*a\right)^\dagger = \left(a^*a\right)^D$. ■

Mosaic and Djordjevic [2] verified that $a^\dagger = \left(a^*a\right)^\dagger a^* = a^*\left(aa^*\right)^\dagger$ in Theorem 1.2 (g). By using lemma 2.3 and Theorem 1.2 (g) in [2] we get Theorem 2.4.

Theorem 2.4

Let R be a ring with involution. If $a \in R^\dagger$, then $a^\dagger = \left(a^*a\right)^D a^* = a^*\left(aa^*\right)^D$

Proof. Let $a \in R^\dagger$, we get

$$a^\dagger = a^\dagger a a^\dagger = a^\dagger\left(aa^\dagger\right)^* = a^\dagger\left(a^\dagger\right)^* a^* = \left(a^*a\right)^\dagger a^* = \left(a^*a\right)^D a^*$$

and

$$a^\dagger = a^\dagger a a^\dagger = \left(a^\dagger a\right)^* a^\dagger = a^*\left(a^\dagger\right)^* a^\dagger = a^*\left(aa^*\right)^\dagger = a^*\left(aa^*\right)^D$$

We conclude that $a^\dagger = \left(a^*a\right)^D a^* = a^*\left(aa^*\right)^D$ ■

Mosaic and Dordjevic said [2] reported that $\left(a^*\right)^\dagger = a\left(a^*a\right)^\dagger = \left(aa^*\right)^\dagger a$ in Theorem 1.2 (h). By using Theorem 2.4 and Theorem 1.2 (h) in [2] on we get Theorem 2.5 .

Theorem 2.5

Let R be a ring with involution. If $a \in R^\dagger$, then $\left(a^*\right)^\dagger = a\left(a^*a\right)^D = \left(aa^*\right)^D a$

Proof. Let $a \in R^\dagger$, we get

$$\left(a^*\right)^\dagger = a\left(a^*a\right)^\dagger = aa^\dagger\left(a^\dagger\right)^* = aa^\dagger\left(a^*\right)^\dagger = a\left(a^*a\right)^D a^*\left(a^*\left(a^*\right)^*\right)^D\left(a^*\right)^* = a\left(a^*a\right)^D a^*\left(a^*a\right)^D a$$
$$= a\left(a^*a\right)^D a^*a\left(a^*a\right)^D = a\left(a^*a\right)^D$$

and

$$\left(a^*\right)^\dagger = \left(aa^*\right)^\dagger a = \left(a^\dagger\right)^* a^\dagger a = \left(a^*\right)^\dagger a^\dagger a = \left(\left(a^*\right)^* a^*\right)^D\left(a^*\right)^*\left(aa^*\right)^D a^*a = \left(aa^*\right)^D a\left(aa^*\right)^D a^*a$$
$$= \left(aa^*\right)^D aa^*\left(aa^*\right)^D a = \left(aa^*\right)^D a$$

We conclude that $\left(a^*\right)^\dagger = a\left(a^*a\right)^D = \left(aa^*\right)^D a$ ■

Mosaic and Dordjevic said in lemma 2.1 that $\left(aa^*a\right)^\dagger = a^\dagger\left(a^*\right)^\dagger a^\dagger$. By using Theorem 2.2 and lemma 2.1 in [2] we get Theorem 2.6 .

IOP Conf. Series: Journal of Physics: Conf. Series **1217** (2019) 012069 doi:10.1088/1742-6596/1217/1/012069

Theorem 2.6

Let R be a ring with involution. If $a \in R^{\dagger}$, then $\left(aa^*a\right)^{\dagger} = a^D\left(a^*\right)^D a^D$

Proof. Let $a \in R^{\dagger}$, we get

First

$$aa^*a\left(aa^*a\right)^D aa^*a = aa^*aa^D\left(a^*\right)^D a^D aa^*a = aa^*a\left(a^*\right)^D a^D a^*a = a^2\left(a^*\right)^2\left(a^D\right)^* a^D a$$
$$= a^2\left(a^D a^2\right)^* a^D a = a^2\left(a\right)^* a^D a = a^2 a^D a^* a = aa^*a$$

Second

$$\left(aa^*a\right)^D aa^*a\left(aa^*a\right)^D = a^D\left(a^*\right)^D a^D aa^*aa^D\left(a^*\right)^D a^D = \left(a^*\right)^D a^D aa^D a^* a^D aa^D\left(a^*\right)^D$$
$$= \left(a^*\right)^D a^D a^* a^D\left(a^*\right)^D = a^D\left(a^D aa^D\right)^* a^D = a^D\left(a^D\right)^* a^D = a^D\left(a^*\right)^D a^D$$

Third

$$\left(aa^*a\left(aa^*a\right)^D\right)^* = \left(a^D\left(a^*\right)^D a^D\right)^*\left(aa^*a\right)^* = a^D\left(a^D\right)^* a^*\left(a^D\right)^* aa^* = a^D\left(a^D aa^D\right)^* aa^* = a^D\left(a^D\right)^* aa^*$$
$$= aa^*a^D\left(a^*\right)^D = aa^*a^D aa^D\left(a^*\right)^D = aa^*aa^D\left(aa^*\right)^D = aa^*a\left(aa^*a\right)^D$$

Fourth

$$\left(\left(aa^*a\right)^D aa^*a\right)^* = \left(aa^*a\right)^*\left(a^D\left(a^*\right)^D a^D\right)^* = \left(a^*a\right)^* a^*\left(a^D\right)^*\left(a^D\left(a^*\right)^D\right)^* = a^*a\left(a^D\right)^* a^*\left(a^D\right)^* a^D$$
$$= a^*a\left(a^D aa^D\right)^* a^D = a^*a\left(a^D\right)^* a^D = \left(a^*\right)^D a^D a^*a = a^D\left(a^*\right)^D a^D aa^*a = \left(aa^*a\right)^D aa^*a$$

So Moore-Penrose inverse has been satisfied, we can conclude that $\left(aa^*a\right)^{\dagger} = a^D\left(a^*\right)^D a^D$ ■

3. Conclusion

Moore-Penrose inverse is very important in finding matrix inverse that singular matrix or rectangular matrix. There are many characters in Moore-Penrose inverse, but there is no developments in recent years. In this paper, we constructed new characteristic in Moore-Penrose by applied Drazin inverse in Moore-Penrose inverse with algebraic proof. The results are $a^{\dagger} = \left(a^*a\right)^D a^* = a^*\left(aa^*\right)^D$ and $\left(a^*\right)^{\dagger} = a\left(a^*a\right)^D = \left(aa^*\right)^D a$ also $\left(aa^*a\right)^{\dagger} = a^D\left(a^*\right)^D a^D$.

References

[1] J.J. Koliha and Pedro Patricio 2002 *Australian Mathematical Society*. **72** 137
[2] Dijana Mosic and Dragan S. Djordjevic 2009 *Linear Algebra Appl*. **431** 732
[3] J.J. Koliha, Dragan Djordjevic and Dragana Cvetkovic 2007 *Algebra Appl*. **426** 371
[4] J.J. Koliha 1999 *Math. Proc. Ir. Acad*. **99A** 17
[5] Pedro Patricio and Roland Puystjens 2004 Linear Algebra and its Applications **389** 159

Applied Drazin Inverse to Moore-Penrose inverse in rings with involution

ORIGINALITY REPORT

16%	2%	13%	7%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Rakoc@?evic, V.. "The representation and approximation of the W-weighted Drazin inverse of linear operators in Hilbert space", Applied Mathematics and Computation, 20030905 Publication	2%
2	Yaoming Yu, Guorong Wang. "The generalized inverse over commutative rings", Linear and Multilinear Algebra, 2006 Publication	2%
3	B. Raddatz. "Molecular typing of Cryptococcus neoformans by PCR fingerprinting, in comparison with serotyping and Fourier transform infrared-spectroscopy-based phenotyping", Medical Mycology, 4/1/2004 Publication	2%
4	Honglin Zou, Jianlong Chen, Pedro Patrício. " Characterizations of -EP elements in rings ", Linear and Multilinear Algebra, 2017 Publication	1%

5	Naimin Zhang. "Solving EP singular linear systems", International Journal of Computer Mathematics, 11/1/2004 Publication	1 %
6	Submitted to Davidson County Schools Student Paper	1 %
7	Submitted to University of Durham Student Paper	1 %
8	Submitted to University of Southampton Student Paper	1 %
9	Yongge Tian, Bo Jiang. "Closed-form formulas for calculating the max–min ranks of a triple matrix product composed by generalized inverses", Computational and Applied Mathematics, 2018 Publication	1 %
10	www.studypool.com Internet Source	1 %
11	Carlos Zapata-Carratala. "Dimensioned Algebra: Mathematics with Physical Quantities", La Matematica, 2022 Publication	1 %
12	Yao Chen, Jian Feng. "Efficient Method for Moore-Penrose Inverse Problems Involving Symmetric Structures Based on Group	1 %

Theory", Journal of Computing in Civil Engineering, 2014
Publication

13	core.ac.uk Internet Source	1 %
14	Submitted to Anglia Ruskin University Student Paper	1 %
15	Submitted to RMIT University Student Paper	1 %
16	V. Luzzati. "Traitement statistique des erreurs dans la determination des structures cristallines", Acta Crystallographica, 11/10/1952 Publication	1 %
17	Youshen Xia, Tianping Chen, Jinjun Shan. "A Novel Iterative Method for Computing Generalized Inverse", Neural Computation, 2014 Publication	1 %

Exclude quotes	On	Exclude matches	Off
Exclude bibliography	On		

Applied Drazin Inverse to Moore-Penrose inverse in rings with involution

GRADEMARK REPORT

FINAL GRADE

/100

GENERAL COMMENTS

Instructor

PAGE 1

PAGE 2

PAGE 3

PAGE 4

THE MINISTRY OF RESEARCH, TECHNOLOGY, AND HIGHER EDUCATION
THE REPUBLIC OF INDONESIA

DIPONEGORO UNIVERSITY
FACULTY OF SCIENCE AND MATHEMATICS

DECREE OF DEAN NUMBER : 1778/UN7.5.8/HK/2018

Certificate

THIS IS TO CERTIFY THAT

Uzer Tarmizi

as

PRESENTER

In the 8th International Seminar on New Paradigm and Innovation on Natural Science and Its Application (8th ISNPINSA)

Held on 26 September 2018 at Gets Hotel, Semarang, Indonesia

with paper entitled as follows:

Applied Drazin Inverse To Moore-Penrose Inverse In Rings With Involution

DEAN OF FSM UNDIP

Prof. Dr. Widowati, S.Si, M.Si
NIP. 196902141994032002

8th ISNPINSA COMMITTEE CHAIRMAN

Dr. Eng. Ali Khumaeni, M.E
NIP. 198308072014041001