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

Judul Prosiding (Artikel)	:	Weakly compact linear operators on space of Dunford integral function		
Nama/ Jumlah Penulis	:	Solikhin, Susilo Hariyanto, Y D Sumanto, **A Aziz**		
Status Pengusul	:	penulis ke-4		
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	:	1524 012045
		d. Penerbit	:	IOP Publishing
		e. DOI artikel (jika ada)	:	10.1088/1742-6596/1524/1/012045
		f. Alamat web penerbit	:	https://iopscience.iop.org/article/10.1088/1742-6596/1524/1/012045
		g. Terindex	:	Scopus, Q4

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* :

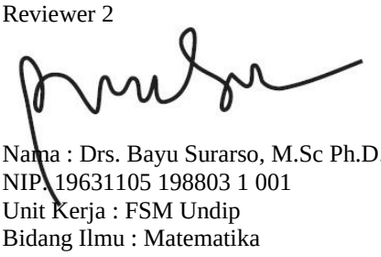
Komponen Yang Dinilai	Nilai Reviewer		Nilai Rata-Rata
	Reviewer 1	Reviewer 2	
a. Kelengkapan unsur isi jurnal (10%)	2,9	2,9	2,9
b. Ruang lingkup dan kedalaman pembahasan (30%)	8,8	8,95	8,875
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	8,8	8,975	8,8875
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	8,7	8,975	8,8375
Total = (100%)	**29,2**	**29,8**	**29,5**
Nilai Pengusul = 40%/3 x 29,5 = 3,93			

Semarang,

Reviewer 1

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

Reviewer 2



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

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

Judul Prosiding (Artikel)	:	Weakly compact linear operators on space of Dunford integral function		
Nama/ Jumlah Penulis	:	Solikhin, Susilo Hariyanto, Y D Sumanto, **A Aziz**		
Status Pengusul	:	penulis ke-4		
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	:	1524 012045
		d. Penerbit	:	IOP Publishing
		e. DOI artikel (jika ada)	:	10.1088/1742-6596/1524/1/012045
		f. Alamat web penerbit	:	https://iopscience.iop.org/article/10.1088/1742-6596/1524/1/012045
		g. Terindex	:	Scopus, Q4

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			8,8
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	9			8,8
d. Kelengkapan unsur dan kualitas terbitan/ Prosiding (30%)	9			8,7
Total = (100%)	**30**			**29,2**
Nilai Pengusul = 40%/3 x 29,2 = 3,893				

Catatan Penilaian artikel oleh Reviewer :

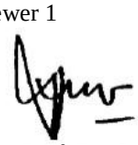
1. **Kesesuaian dan kelengkapan unsur isi prosiding:**
   Kesesuaian artikel prosiding ini baik. Demikian juga kelengkapan unsurnya juga baik.

2. **Ruang lingkup dan kedalaman pembahasan:**
   Lingkup pembahasan tentang operator linier dalam ruang fungsi terintegral dunford cukup mendalam dan sistematis.

3. **Kecukupan dan kemutakhiran data/informasi dan metodologi:**
   Topik yang dibahs mengandung unsur mutakhir dalam kajian bidang analisis dengan didukung 12 referensi dengan 8 referensi sudah out of date < 10 tahun.

4. **Kelengkapan unsur dan kualitas terbitan:**
   Unsur terbitan dan kualitas sudah terstandar internasional dengan kualitas baik. Dengan similarity 18%.

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)	:	Weakly compact linear operators on space of Dunford integral function		
Nama/ Jumlah Penulis	:	Solikhin, Susilo Hariyanto, Y D Sumanto, **A Aziz**		
Status Pengusul	:	penulis ke-4		
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	:	1524 012045
		d. Penerbit	:	IOP Publishing
		e. DOI artikel (jika ada)	:	10.1088/1742-6596/1524/1/012045
		f. Alamat web penerbit	:	https://iopscience.iop.org/article/10.1088/1742-6596/1524/1/012045
		g. Terindex	:	Scopus, Q4

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			8,975
d. Kelengkapan unsur dan kualitas terbitan/ Prosiding (30%)	9			8,975
Total = (100%)	**30**			**29,8**
Nilai Pengusul = 40%/3 x 29,8 = 3,973				

Catatan Penilaian artikel oleh Reviewer :

1. **Kesesuaian dan kelengkapan unsur isi prosiding:**
   Isi artikel ditinjau dari kelengkapan unsur sudah sesuai kriteria yakni abstrak, introduction, preliminare, result and discussion, conclusion, aknownledgment dan references, , namun metodologi penelitian tidak disampaikan secara eksplisit

2. **Ruang lingkup dan kedalaman pembahasan:**
   Lingkup dan kedalaman pembahasan cukup baik. Artikel ini membahas kompak lemah pada himpunan fungsi-fungsi terintegral Dunford.

3. **Kecukupan dan kemutakhiran data/informasi dan metodologi:**
   Informasi yang diuraikan dalam artikel tingkat orisinilitasnya baik dalam kajian matematika analisis., sehingga unsur kemutakhiran baik. Artikel didukung dengan Pustaka sebanyak 12 paper.

4. **Kelengkapan unsur dan kualitas terbitan:**
   Unsur dan kualitas terbitan lengkap dan baik. Artikel diterbitkan pada IOP Publishing.

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

Weakly compact linear operators on space of Dunford integral function

Solikhin S. ; Hariyanto S.; Sumanto Y.D.; Aziz A.
Save all to author list

[a] Department of Mathematics, Faculty of Science and Mathematics DiponegoroUniversity, Jl. Prof. Soedarto, S.H., Semarang, 50275, Indonesia

Abstract

This study discussed the integral of Dunford and compact linear operator on space of Dunford integral function. For each f which is Dunford integral on [a,b] is defined as an operator DL by DL (x ∗) = x ∗ f, for each x ∗ ∈ X ∗ This study resulted that the operator DL is both a continuous linear operator and weakly compact operators. Then, it was defined as the adjoint of the operator by each h ∈ (L 1)∗ The adjoint operator is continuous and weakly compact linear operators. © Published under licence by IOP Publishing Ltd.

References (12)

1 Cao, S.C.
The Henstock Integral for Banach-valued Functions
(1992) *Southeast Asian Bull. Math*, 16, pp. 35-40. Cited 64 times.

2 Cao, S.C.
(1993) *Southeast Asian Bull. Math. Special Issue*, pp. 1-3.

3 Ye, G.
On Henstock-Kurzweil and McShane integrals of Banach space-valued functions
(2007) *Journal of Mathematical Analysis and Applications*, 330 (2), pp. 753-765. Cited 7 times.
doi: 10.1016/j.jmaa.2006.08.020
View at Publisher

4 Park
(2006) *Journal of the Chungcheong Mathematical Society*, 19, pp. 231-236.

5 Schwabik, Š., Guoju, Y.
Topics in banach space integration
(2005) *Topics In Banach Space Integration*, pp. 1-298. Cited 77 times.
https://www.worldscientific.com/worldscibooks/10.1142/5905#t=toc

Scopus Preview

Source details

Journal of Physics: Conference Series

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

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

CiteScore 2021
0.8

SJR 2021
0.210

SNIP 2021
0.395

CiteScore | CiteScore rank & trend | Scopus content coverage

ⓘ 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

$$0.8 = \frac{74{,}925 \text{ Citations 2018 - 2021}}{96{,}702 \text{ Documents 2018 - 2021}}$$

Calculated on 05 May, 2022

CiteScoreTracker 2022 ⓘ

$$0.9 = \frac{87{,}675 \text{ Citations to date}}{95{,}266 \text{ Documents to date}}$$

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

Journal of Physics: Conference Series **1524** (2020) 011001 doi:10.1088/1742-6596/1524/1/011001

The 9th International Seminar on New Paradigm and Innovation on Natural Science and Its Application

October 22, 2019

Semarang, Indonesia

LIST OF REFEREES AND EDITORS

I. Team of Reviewers and Referees

Prof. Dr. Widowati, S.Si., M.Si. (Diponegoro University)
Dr. Eng. Adi Wibowo, S.Si., M.Kom. (Diponegoro University)
Dr. Drs. Sutimin, M.Si. ((Diponegoro University)
Prof. Drs. Mustafid, M.Eng., Ph.D. (Diponegoro University)
Dr. Tarno, M.Si. (Diponegoro University)
Dr. Budi Warsito, M.Si. (Diponegoro University)
Dr. Di Asih I Maruddani, M.Si. (Diponegoro University)
Dr. Drs. Rukun Santoso, M.Si. (Diponegoro University)
Dr. Redemtus Heru Tjahjana, S.Si., M.Si. (Diponegoro University)
Dinar M.K.N., S.T., M.InfoTech.(Comp)., Ph.D. (Diponegoro University)
Dr. Dra. Tatik Widiharih, M.Si. (Diponegoro University)
Farikhin, M.Sc., Ph.D. (Diponegoro University)
Drs. Sapto P. Putro, M.Si., Ph.D. (Diponegoro University)
Dr. Jafron W. Hidayat, M.Sc. (Diponegoro University)
Dr. Munifatul Izzati, M.Sc. (Diponegoro University)
Dr.rer.nat. Anto Budiharjo, M.Biotech., Ph.D. (Diponegoro University)
Dr. Tri Retnaningsih Soeprobowati, M.Si. (Diponegoro University)
Dr. Endang Kusdiyantini, DEA. (Diponegoro University)
Dr. Hermin Pancasakti K., M.Si. (Diponegoro University)
Rully Rahadian, M.Si., PhD. (Diponegoro University)
Dr. Agung Janika Sitasiwi, M.Si. (Diponegoro University)
Dr. Erma Prihastanti, M.Si. (Diponegoro University)
Prof. Dr. Wahyu Setia Budi, MS. (Diponegoro University)
Dr. Muhammad Nur, DEA. (Diponegoro University)
Dr. Kusworo Adi, MT. (Diponegoro University)
Dr. Heri Sutanto, M.Si. (Diponegoro University)
Dr. Suryono, M.Si. (Diponegoro University)
Dr. Eng. Ali Khumaeni, M.E. (Diponegoro University)
Dr. Udi Harmoko, S.Si., M.Si. (Diponegoro University)
Dr. Rahmat Gernowo, M.Si. (Diponegoro University)
Ismiyarto, M.Si., Ph.D. (Diponegoro University)
Dr. Retno Ariadi Lusiana, M.Si. (Diponegoro University)
Nor Basid Adiwibawa P., S.Si., M.Sc., Ph.D (Diponegoro University)

II. Team of Technical Editors

Dr. Suryono, S.Si., M.Si. (Diponegoro University)
Nor Basid Adiwibawa P., S.Si., M.Sc., Ph.D (Diponegoro University)
Heri Sugito, S.Si., M.Sc. (Diponegoro University)
Alik Maulidiyah, S.Si., M.Sc. (Diponegoro University)

LIST OF SPEAKER

I. Keynote Speaker

No.	Name	Research Field	Institution	Country
1.	Prof. Emmanuel Cornillot	Biotechnology	Universite de' Monpellier	Perancis
2.	Prof. Dr. Baba Musta	Geochemistry	Faculty of Science, UMS	Malaysia
3.	Prof. Dr. Ir. Rokhmin Dahuri, MS.	Marine Resource and Environmental Studies	President of Indonesian Aquaculture Society; Proffesor in Marine Resource and Environmental Studies	Indonesia
4.	Sapto P. Putro, M.Si., Ph.D.	Marine Ecology and Aquaculture	Faculty of Science and Mathematics, Diponegoro University	Indonesia

II. Invited Speaker

No.	Name	Department	Institution	Country
1.	Dinar Mutiara Kusumo Nugraheni, S.T., M.InfoTech.(Comp).	Computer Science	FSM UNDIP	Indonesia
2.	Dr. Eng. Ali Khumaeni, S.Si., MS	Physics	FSM UNDIP	Indonesia
3.	Dr. M. Cholid Djunaidi, M.Si.	Chemistry	FSM UNDIP	Indonesia
4.	Dr. Lilih Khotimperwati, S.Si., M.Si.	Biology	FSM UNDIP	Indonesia
5.	Dr. Tarno, M.Si.	Chemistry	FSM UNDIP	Indonesia
6.	Farikhin, M.Sc. Ph.D.	Mathematics	FSM UNDIP	Indonesia

LIST OF COMMITTEE

I. Steering committee

Prof. Dr. Widowati, M.Si.
Farikhin, S.Si., M.Si., Ph.D.
Dr. Kusworo Adi, S.Si., MT.
Sapto P. Putro, M.Si., Ph.D.

II. Organizing Committee

1. Dr. Suryono, M.Si.
2. Nor Basid Adiwibawa Prasetya, S.Si., M.Sc., Ph.D.
3. Dinar Mutiara Kusumo Nugraheni, S.T., M.InfoTech.(Comp).
4. Nurdin Bahtiar, S.Si., M.Kom.
5. Dr. Eng. Ali Khumaeni, ME.
6. Dr. Di Asih I Maruddani, S.Si., M.Si.
7. Dra. Sri Harumaningsih, .S.Si., M.IP.
8. Lilik Maryuni, S.E., M.Si
9. Novita Sulistyana, S.E., M.Si.
10. Susilo Wanto, SH
11. Herman Aprianto, S.Kom.
12. Iys Syabilla Rusda, S.IP.
13. Choiriyah, SE
14. Nur Azizah, SE
15. Alik Maulidiyah, S.Si. M.Sc.
16. Rahmawan Bagus Trianto, S.Kom.
17. Deby Yuniarto
18. Siswoyo

Table of contents

Volume 1524

2020

Previous issue Next issue

The 9th International Seminar on New Paradigm and Innovation of Natural Sciences and its Application 22 October 2019, Central Java, Indonesia

Accepted papers received: 16 April 2020
Published online: 22 June 2020

Open all abstracts

Preface

Papers

Isolation and identification of rare actinomycete-like bacteria from soil-based on 16S ribosomal RNA gene sequences

Y Eshananda[1], F Ningsih[1,2], Y Sakai[3,4], A Yokota[3], S Yabe[3,4], W Sjamsuridzal[1,2]

[1]Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Indonesia, Kampus UI Depok, Depok 16424, Indonesia
[2]Center of Excellence for Indigenous Biological Resources-Genome Studies, Faculty of Mathematics and Natural Sciences, Universitas Indonesia, Kampus UI Depok, Depok 16424, Indonesia
[3]Department of Microbial Resources, Graduate School of Agricultural Science, Faculty of Agricultural, Tohoku University, 468-1 Aoba, Aramaki, Sendai, Miyagi 980-0845, Japan
[4]Hazaka Plant Research Center, Kennan Eisei Kogyo Co., Ltd., 44 Aza-Inariyama, Oaza-Ashitate, Murata-Cho, Shibata gun, Miyagi 989-1311, Japan.

Corresponding author: yuriza.eshananda@ui.ac.id

Abstract. The rare actinomycete-like bacteria are mycelium-forming bacteria other than phylum *Actinobacteria* that difficult to isolate and cultivate. This group of bacteria was recently speculated by many scientists as a potential new microbial resource for the discovery of novel compounds, as a substitute for actinomycetes. In this study, we isolate and identify rare actinomycete-like bacteria from forest soil collected under bamboo trees, near the CisolokGeysers, Sukabumi, Indonesia. The isolation of bacteria was performed using Reasoner's 2A (1:10 dilution) medium with 2% gellan gum instead of agar and incubated at 30 °C for three weeks. The 16S rRNA gene sequences of the isolates were examined to determine their taxonomic position. Four isolates designated K17-1, K17-2, K42, and K44 showed pale oranges colonies and formed mycelia were obtained. The results of 16S rRNA gene sequences of these isolates showed high similarity to members of the genus *Dictyobacter* in the family *Dictyobacteraceae* of the class *Ktedonobacteria* of the phylum *Chlorofexi*, with values 97.16-98.02%, and most closely related to the species *Dictyobacteraurantiacus* S-27^T (97.16-98.02% similarities). This result suggested that the member of the class *Ktedonobacteria*, which considered as rare actinomycete-like bacteria, such as *Dictyobacter* could be found in the forest soil of the geothermal area.

1. Introduction

Actinobacteria are gram-positive bacteria that have a high percentage of guanine and cytosine in their genome [1]. This group morphologically comprises unicellular organisms to mycelium-forming bacteria which called Actinomycetes [1,2]. However, bacteria that have filamentous appearance also could be found in the phylum *Chlorofexi*. The member of this phylum which has actinomycete-like morphology is present in the four different class namely *Chlorofexi*, *Anaerolineae*, *Caldilineae*and *Ktedonobacteria* [3]. Among these class, *Ktedonobacteria* has some obvious morphological features which distinguish themselves from others. The member of *Ktedonobacteria*are aerobic organism and forming branched mycelia with spores like actinomycetes [3,4]. Moreover, most validly published strains of *Ktedonobacteria*budding their multiple spores per cell on the aerial mycelium which unique among bacteria [5]. All of*Ktedonobacteria*identified as gram-positive bacteria while almost of the member in phylum *Chlorofexi* were gram-negative [3,6]. Based on these exceptional characters, class *Ktedonobacteria* could be included as the rare actinomycete-like bacteria.

Rare actinomycete-like bacteria could provide an alternative for the discovery of new compounds derived from microorganisms because spore formation usually would be followed by the production of secondary metabolites [7,8]. Further analysis of the genomic of nine members of rare actinomycete-like bacteria

Hoax news validation using similarity algorithms

S Y Yuliani[1,2], S Sahib[2], M F Abdollah[2], Y S Wijaya, N H M Yusoff

[1]Information Security and Networking Research Group (InFORSNET), Faculty of Information Communication Technology, Universiti Teknikal Malaysia Melaka Malaka, Malaysia
[2]Informatic Department, Faculty Engineering, University Widyatama Bandung, Indonesia

Corresponding author: sy.yuliany@gmail.com

Abstract. News that is presented every day on social media dramatically affects the feelings, feelings, thoughts, or even actions of a person or group. Hoax News is one of them which is disturbing the public and raising noise in various fields, ranging from politics, culture, security, and order, to the economy. Inseparable from social media users. How every day, there is information on social media, which is not necessarily true so that people are provoked by hoax on social media. The news detection system in this study was designed using Unsupported Learning so that it does not require data training. The system was built using the Equation algorithm to calculate the validity of document similarity. Extraction results used to search for content related to user input using a detection engine, then the similarity value and the time needed to utilize hoax news are calculated. System validation testing by using a four text similarity algorithm called the Equation algorithm, the Levenshtein algorithm, the Smith-Waterman algorithm, the Damerau Levenshtein algorithm; this algorithm is used to find the best analytical solution of news hoaxes and submissions needed to find the news hoax password. The final results of the deception detection research using a script that has been done for Validation using an algorithm, get the value of accuracy in detection using the Smith-Waterman algorithm, which produces an accuracy value of text similarity of 99.29% and can be used a process of 6, 57 seconds, followed by the second sequence that is the similarity algorithm produces an accuracy of 75% and requires a processing time of 4.94 seconds, then the third sequence is the Levenshtein algorithm with an accuracy of 55.02% and requires a processing time of 5.49 seconds, and is used today is Damerau Levenshtein algorithm is 55.02% and requires a processing time of 7.54%. The results of research tests on this text can conclude the more text on the detection engine, the higher the verification value and the higher the time needed to process hoax news.

1. Introduction

Sharing information is a positive thing, but not all information disseminated through social media is in the form of facts. There have been various cases of spreading the news that is not facts or often called hoaxes. Whereas hoax is critical information that misleads human perception by spreading false information but considered as valid, No wonder then the intensity of fake news and hoax news on social media is so viral on social media [1]. For personal and group benefit by spreading harmful content that caused unrest and mutual suspicion in the community [2]. The ease and speed of dissemination on social media make this hoax news known to many people in a relatively short period, and can to more people.

Weakly compact linear operators on space of Dunford integral function

by Susilo Hariyanto

Submission date: 16-Feb-2023 04:08AM (UTC+0700)
Submission ID: 2015096584
File name: C-15_organized.pdf (484.74K)
Word count: 2525
Character count: 11513

Weakly compact linear operators on space of Dunford integral function

S Solikhin, S Hariyanto, Y D Sumanto, A Aziz

Department of Mathematics, Faculty of Science and Mathematics DiponegoroUniversity, Jl. Prof. Soedarto, S.H. Semarang, 50275

Corresponding author: soli_erf@yahoo.com

Abstract. This study discussed the integral of Dunford and compact linear operator on space of Dunford integral function. For each f which is Dunford integral on $[a,b]$ is defined as an operator D_L by $D_L(x^*) = x^* f$, for each $x^* \in X^*$. This study resulted that the operator D_L is both a continuous linear operator and weakly compact operators. Then, it was defined as the adjoint of the operator D_L^* by $D_L^*(h)(x^*) = \int_a^b h D_L(x^*)$ each $h \in (L_1)^*$. The adjoint operator D_L^* is continuous and weakly compact linear operators.

1. Introduction

In many applications, for example in differential equations, optimization and so forth do not rule out the possibility of integral problems faced with Banach X valued functions. The study of integral theory for Banach's valued functions has developed and it becomes an interesting topic for researchers. Many researchers study the integral theory of a Banach-valued or vector-valued function which is the development of a real valued function. For example, such as the Bochner integral [1], the Henstock-Bochner integral [2], integral integral [3], function [4], and Dunford integrals [5].

Integral Bochner was introduced by Salomon Bochner. He extended the Lebesgue integral definition [6] into the Banach valued function. The function f of a closed interval I into the Banach space X is Bochner integrable if there is a sequence of simple functions $(f_n), \forall n \in N$ such that $\lim_{n\to\infty} \int_I \|f_n - f\| d\mu = 0$ [5]. As for the Dunford integral, it defines the integral of a weakly measurable function. The X^* (X^* is the) real-valued function is Lebesgue integrable [5].

Studies for Dunford integrals have been expanded into Riemann type integrals, such as -Dunford Henstock-Pettis [7]. The integration of Henstock-Dunford requires that the function of real value $x^* f$ integral Henstock [8]. Integrated into Henstock[8]. Not only limited to this, but the Henstock-Dunford integral is also generalized in the Euclidean space, namely the Henstock-Dunford integral in the Euclidean space.

The study of integral theory is also combined with operator theory. Several properties of the positive Dunford-Pettis operator [9] have been discussed. Operators working in the space of Bochner integrable function. Next, operators are examined in the space of Dunford integrable function [10].

Taking into account the results of operator studies on space of Dunford integrable function. it will be examined more specifically about weakly compact operators and adjoint operators [11] on space of Dunford integrable function. How are the weakly compact operators and its adjoint operator and the relationship of the two operators.

2. Weakly measurable functions

The following discu[12]es the measurable functions and weak measurable functions valued at Banach.

Definition 2.1 [5] [redacted] $:[a,b]\to$ [redacted] *simple* , [redacted] *there* [redacted] *a measurable set* $A_k \subset [a,b]$, $k=1,2,...,q$ *so that* $A_k \cap A_j = \varnothing$, *for each* $k \neq j$ *and* $[a,b]=\bigcup_{k=1}^{q} A_k$, *where* $f(x)=y_k \in X$ *for* $x \in A_k, k=1,2,...,q$.

Based on simple functions, measurable functions can be defined as follows.

Definition 2.2 [5] *A function* f *is said to be measurable if there is a simple sequence of functions* $(f_k), k \in N$ *with*

$$\lim_{k\to\infty} \|f_k(x)-f(x)\|_X = 0 ,$$

for almost all $x \in [a,b]$.

According to Definition 2.2, so [20]imple functions are measurable functions. Furthermore, if the f measured function , then the real [redacted] also [redacted] measurable function.

Theorem 2.3 [5] *If* f *is a measurable function , then the real function* [2][redacted] *measurable* [redacted]

: Because [redacted] functions are measurable, there are simple functions such $(f_k), k \in N$ so that

$$\lim_{k\to\infty} \|f_k(x)-f(x)\|_X = 0$$

for each $x \in [a,b]$. Because f_k it is a simple function for all $k \in N$, therefore $\|f_k\|_X$ it is also a simple function for all $k \in N$. Therefore, f_k the function is measurable so it applies

[redacted]

for almost all $x \in [a,b]$ .This means $\lim_{k\to\infty} \|f_k($ [19][redacted] measurable. □

Definition 2.4 [5] *A functions* f *said to be* [5][redacted] $\in X^*$ [redacted] *real* [redacted].

Each measurable function [redacted] weakly measurable function

Theorem 2.5 [5] [14][redacted].

Proof: Measured [redacted] function, meaning there [12][redacted] $(f_k), k \in N$ so that

$$\lim_{k\to\infty} \|f_k(x)-$$ [11][redacted]

[redacted] each [redacted]].

Taken arbitrarily [redacted], then apply

[redacted] [25][redacted]

and $\lim_{k\to\infty}\left|x^*\left(f_k\left(\right)\right)\right|=0$ .So, is weakly measurable. □

Based on the measurable function of weak lemma construction which will guarantee the existence of the Dunford integral.

Lemma 2.6 Dunford [5] *Assume and it dual X . If is weakly measurable that of real-value :[a,b]→R is Lebesgue integrable i.e., $x^*f\in L_1$, then for each measurable set $A\subset[a,b]$ there exists a unique $\in$ such that*

$$\left(,A\right)\left($$

for every .

Proof: [5, 10] □

3. Dunford integral

The definition of the Dunford integral is given and it is shown .

Definition 3.1 [5] *Assume and it is dual of X . The function $f:[a,b]\to X$ said to be Dunford integrable on $[a,b]$ each al functions is Lebesgue integrable and for each set of measurable $A\subset[a,b]$ there exists a unique $,A)\in$ such that*

$$\left(,A\right)\left($$

r every .

denoted by $D_L[a,b]$. For $f\in D_L[a,b]$ means that f is Dunford integrable on $[a,b]$.

Theorem 3.2 [10] *If $f\in D_L[a,b]$, then for every single measurable set $A\subset[a,b]$ vector $x^{**}_{(f,A)}\in X^{**}$ single.*

Proof: [10].

Examples of Dunford integrable functions are constant functions, continuous functions, Riemann integrable fu tions, Lebesgue integrable functions [10] and so on.

Theorem 3. Dunford] $^*\in X^*$ *function f Lebesgue int rable on [,b].*

: Based on Definition Dunford on [Lebesgue on $[a,b]$ .Conversely, if the real function x^* Lebesgue Dunford].

It was further shown that the collection of all functions f that Dunford integrated on $[a,b]$, is linear space.

Theorem 3.4 *The collection of all functions f that Dunford integrated on $[a,b]$, $D_L[a,b]$ is linear space.*

Proof: Let $f\in D_L[a,b]$ arbitrarily $c\in R$. It shows that $f+g\in D_L[$ $cf\in D_L[$] . For $,g\in D_L[$] $^*\in X^*$ and g are Lebesgue integrable on $[a,b]$. So that for any $x^*\in$ $+g)=$ g Lebesgue integrable on $[a,b]$. So, the

function $f+g$ is Dunford integrable on $[a,b]$. Furthermore, for any scalar $c \in R$ and [redacted] $^*(cf) = cx^*$ [redacted] Lebesgue [redacted] on $[a,b]$. So, the function cf is Dunford integrable on $[a,b]$.

4. Weak [redacted] compact operators on space of Dunford integral function

Suppose [redacted] its dual [redacted]* and [redacted] dual X^*. By L_1 is space of Lebesgue integrable functions on $[a,b]$.

Defined operator $D_L : X^* \to L_1$ by

$$D_L(x^*) = x^* f,$$

for every $x^* \in X^*$.

The operator D_L as in the definition is a bounded linear or continuous linear operator.

Theorem 4.1 [5] *The operator D_L is a bounded linear operator.*

Proof: Let arbitrarily $x^*, z^* \in X^*$ and arbitrarily $c \in R$. We obtained

$$\begin{aligned} D_L(x^* + z^*) &= (x^* + z^*) f \\ &= x^* f + z^* f \\ &= D_L(x^*) + D_L(z^*), \end{aligned}$$

and

$$D_L(cx^*) = (cx^*) f = cx^* f = cD_L(x^*).$$

So it's a linear operator. Furthermore, according to the Closed Graph Banach Theorem, operators D_L are bounded. □

Lemma 4.2 [11], [12] *The dual space L_1 is L_∞, i.e. $L_1^* = L_\infty$.*

Proof: For each $y = \{y_n\} \in L_\infty$ functional formed f_y on L_1 by

$$f_y(x) = \sum_{n=1}^{\infty} x_n y_n .$$

We obtained that f_y linear and continuous, i.e. for any $x = \{x_n\}, z = \{z_n\} \in L_1$ and any scalar $c \in R$ gives

$$f_y(x+z) = \sum_{n=1}^{\infty} (x_n + z_n) y_n = f_y(x) + f_y(z) \text{ and } f_y(cx) = \sum_{n=1}^{\infty} (cx_n) y_n = c f_y(x).$$

Furthermore for each $x = \{x_n\} \in L_1$ gives

$$|f_y(x)| = \left| \sum_{n=1}^{\infty} x_n y_n \right| \le \|x\|_1 \|y\|_\infty .$$

So that each $y = \{y_n\} \in L_\infty$ determines with a single functional linear continuous f_y at L_1, or $L_\infty \subset L_1^*$.

Instead, take any continuous functional linear f on L_1. For each, $x = \{x_n\} \in L_1$ it can be represented by

$$x = \sum_{n=1}^{\infty} x_n e_n ,$$

with $e_n = \left\{ 0,\ldots,\underset{n}{1},0,\ldots,0 \right\}$.

Since f is linear,

$$f(x)=f\left(\sum_{n=1}^{\infty}x_n e_n\right)=\sum_{n=1}^{\infty}x_n f(e_n).$$

This means that $f(x)$ it is a linear combination of rows of numbers $\{f(e_n)\}$ or continuous linear functional f depending on rows of numbers $\{f(e_n)\}$.

Furthermore, because the function f is continuous, so $|f(x)|$ bounded, that is $|f(x)|<\infty$. According to the Cauchy-Schwartz Inequality, it was obtained

10 [redacted] $\|_{L_1}$ sup [redacted]

So that $f(x)$ bounded it must be $\sup_{n\geq 1}|f(e_n)|<\infty$. This means that $y=\{f(e_n)\}\in L_\infty$.

Thus, any continuous linear function f in L_1 determining with a single vector $y=\{f(e_n)\}\in L_\infty$, then $L_1^*\subset L_\infty$.

So, that $L_\infty\subset L_1^*$ and $L_1^*\subset L_\infty$, so $L_1^*=L_\infty$. □

For each $f\in D_L[a,b]$ defined $D_L^*:L_1^*\to X^{**}$ by an operator

$$D_L^*(h)(x^*)=\int_a^b hD_L(x^*)=\int_a^b hx^* f,$$

for every $h\in L_1^*=L_\infty$.

An operator T^* is called adjoint operators against operators $T:X^*\to L_1$ on L_1.

Theorem 4.3 [5] *The adjoint operator D_L^* is bounded linear operators and*

$$\|D_L^*\|=\|D_L\|.$$

Proof: The operator adjoint D_L^* linear for arbitrary $h_1,h_2\in L_1^*=L_\infty$ and any scalars $c_1,c_2\in R$ gives

$$D_L^*(c_1h_1+c_2h_2)(x^*)=\int(c_1h_1+c_2h_2)D_L(x^*)=c_1\int(h_1D_L(x^*))+c_2\int(h_2D_L(\text{9}$$
$$=c_1D_L^*(h_1)(\text{[redacted]}^*)+c_2D_L^*(h_2)(\text{[redacted]}^*).$$

Because $f\in D_L[a,b]$ and 22 [redacted] then $\|D_L^*(\text{[redacted]}^*\|\leq\|h\|\|D_L\|$.

So,

$$\|D_L^*\|\leq\|D_L\|.$$

For each $x_0^*\neq\theta\in X^*$ there is $h_0\in X^{**}$ with $\|h_0\|=1$ and $h_0(D_L(x_0^*))=\|D_L(x_0^*)\|$.

So,

$$h_0(D_L(x_0^*))=D_L^*(h_0)(x_0^*).$$

Let $f_0=D_L^*(h_0)$ and obtained

$$\|D_L(x_0^*)\|=h_0D_L(x_0^*)=f_0(x_0^*)\leq\|f_0\|\|x_0^*\|=\|D_L^*(h_0)\|\|x_0^*\|\leq\|D_L^*\|\|h_0\|\|x_0^*\|.$$

Since $\|h_0\|=1$, so for every $x_0^*\neq\theta\in X^*$ such that $\|D_L(x_0^*)\|\leq\|D_L^*\|\|x_0^*\|$.

So, 16 [redacted].

Because $\|$ [redacted] $\|$ and $\|$ [redacted] $\|$, then $\|$ [redacted] $\|$.

Theorem 4.4 *If* $D_L : X^* \to L_1$ *and* $T_L : X^* \to L_1$ *are bounded linear operators and any scalar* $c \in R$, *then*

(i) $\left(D_L + T_L\right)^* = D_L^* + T_L^*$.

(ii) $\left(cD_L\right)^* = cD_L^*$.

(iii) $\|$ [redacted] $\|^2 = \|$ [redacted] $\|^2$.

Proof: (i) $\left($ [redacted] $+T_L\right)^*\left($ [redacted] $\right)\left(x^*\right) = \int h\left(D_L + T_L\right)\left(x^*\right) = \int hD_L\left(x^*\right) + \int hT_L\left(x^*\right) = D_L^*(h)\left(x^*\right) + T_L^*(h)\left($ [redacted]

(ii) $\left(cD_L\right)^*(h)\left($ [redacted] $\right) = \int_a^b h\left(cD_L\right)\left($ [redacted] $\right) = c\int_a^b hD_L\left(x^*\right) = cD_L^*(h)\left(x^*\right)$.

(iii) Because D_L and D_L^* are bounded linear operators and $\|$ [redacted] $\|$, then $\|$ [redacted] $\|^2 = \|$ [redacted] $\|^2$. □

If $f \in$ [redacted] $[a,b]$ the adjoint operator [redacted].

Theorem 4.5 [5] *Assume* [redacted] *Dunford* [redacted] *operator* $D_L : X^* \to L_1$ *is* [redacted] *operator* [redacted] *the* [redacted] *operator* $D_L^* : L_\infty \to$ [redacted] *operator.*

: According to Gantmacher's theorem, the operator D_L is a [redacted] operator [redacted] operator D_L^* [redacted] also a [redacted] operator. □

5. Conclusion

Based on the results of the discussion outlined in the form of several theorems, it can be concluded that the collection of all functions integrated Dunford is linear space. For each function which is Dunford integral can be constructed by an operator. Its continuous linear operator and weakly compact operators. Furthermore, the adjoint operator is continuous and weakly compact linear operators.

Acknowledgments

The author would like to thank the Faculty of Science and Mathematics at Diponegoro University for providing funding for this research, by number: 4901/UN7.5.8/PP/2019.

Reference

[1] Cao SC 1992 The Henstock Integral for Banach-valued Functions *Southeast Asian Bull. Math***16** 35-40
[2] Cao SC 1993 *Southeast Asian Bull. Math. Special Issue* 1-3
[3] Guoju Y 2007 *J. Math. Anal. Appl.* **330** 753–765
[4] Park at all 2006 *Journal of the Chungcheong mathematical society* **19** 231-236
[5] Schwabik S and Guoju Y 2005 *Topics in Banach Space Integration* (Singapore: World Scientific)
[6] Gordon R A 1994 *The Integral of lebesgue, Denjoy, Perron, and Henstock*(USA: Mathematical Society)
[7] Guoju Y and Tianqing A 2001 *IJMMS***25** 467-478
[8] Lee PY 1989 *Lanzhou Lectures on Henstock Integration* (Singapore: World Scientific)
[9] Aqzzouz B, Elbourb A and Hmichane J 2009 *J. Math. Anal. App.***354**295–300
[10] Solikhin 2018 *Journal of Fundamental Mathematics and Application (JFMA)* **2** 110-121
[11] Kreyszig E 1989 *Introductory Funtional Analysis with Applications* (USA: John Willey & Sons)
[12] Darmawijaya S 2007 *Pengantar Analisis Abstrak* (Yogyakarta:Jurusan Matematika Fakultas MIPA Universitas Gadjah Mada)

Weakly compact linear operators on space of Dunford integral function

ORIGINALITY REPORT

18%	9%	14%	5%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Diomedes Barcenas, Carlos E. Finol. "Chapter 4 On Vector Measures, Uniform Integrability and Orlicz Spaces", Springer Science and Business Media LLC, 2009 Publication	2%
2	Jean-Paul Penot, Robert Ratsimahalo. "On the Yosida approximation of operators", Proceedings of the Royal Society of Edinburgh: Section A Mathematics, 2007 Publication	1%
3	Submitted to University of Portsmouth Student Paper	1%
4	Charalambos D. Aliprantis, Owen Burkinshaw. "Chapter 5 Compactness Properties of Positive Operators", Springer Science and Business Media LLC, 2006 Publication	1%
5	Mandrekar, Vidyadhar, and Barbara Rüdiger. "Preliminaries", Probability Theory and Stochastic Modelling, 2015.	1%

	Publication	
6	www.arxiv-vanity.com Internet Source	1 %
7	siba-ese.unile.it Internet Source	1 %
8	ejournal2.undip.ac.id Internet Source	1 %
9	pt.scribd.com Internet Source	1 %
10	Submitted to Louisiana Tech University Student Paper	1 %
11	Submitted to University of Essex Student Paper	1 %
12	"Measure Theory Oberwolfach 1983", Springer Science and Business Media LLC, 1984 Publication	1 %
13	Sokol Bush Kaliaj. "Dunford–Henstock–Kurzweil and Dunford–McShane Integrals of Vector-Valued Functions Defined on m-Dimensional Bounded Sets", Mediterranean Journal of Mathematics, 2020 Publication	<1 %
14	A. McKee, I.G. Todorov, L. Turowska. "Herz–Schur multipliers of dynamical systems", Advances in Mathematics, 2018	<1 %

	Publication	
15	pub-london.escribemeetings.com Internet Source	<1 %
16	www.ee94.dial.pipex.com Internet Source	<1 %
17	Submitted to City University of Hong Kong Student Paper	<1 %
18	www.lastplace.com Internet Source	<1 %
19	www.math.univ-toulouse.fr Internet Source	<1 %
20	Cerone, P.. "New bounds for the Cebysev functional", Applied Mathematics Letters, 200506 Publication	<1 %
21	E SCHECHTER. "Generalized Riemann Integrals", Handbook of Analysis and Its Foundations, 1997 Publication	<1 %
22	Mohsen Alishahiha, Hossein Yavartanoo. "Conformally Lifshitz solutions from Horava–Lifshitz Gravity", Classical and Quantum Gravity, 2014 Publication	<1 %
23	citeseerx.ist.psu.edu Internet Source	<1 %

24	journal.unnes.ac.id Internet Source	<1%
25	www.math.uchicago.edu Internet Source	<1%
26	"Probability and Banach Spaces", Springer Science and Business Media LLC, 1986 Publication	<1%
27	Jeribi, Aref, and Bilel Krichen. "Fundamentals", Monographs and Research Notes in Mathematics, 2015. Publication	<1%
28	M. Ali Khan, Nobusumi Sagara, Takashi Suzuki. "An exact Fatou lemma for Gelfand integrals: a characterization of the Fatou property", Positivity, 2015 Publication	<1%
29	Sokol Bush Kaliaj. "The New Extensions of the Henstock–Kurzweil and the McShane Integrals of Vector-Valued Functions", Mediterranean Journal of Mathematics, 2018 Publication	<1%

Exclude quotes	On	Exclude matches	Off
Exclude bibliography	On		

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

DIPONEGORO UNIVERSITY
FACULTY OF SCIENCE AND MATHEMATICS

RECTOR'S DECREE NUMBER : 759/UN7.P/HK/2019

CERTIFICATE

THIS IS TO CERTIFY THAT

Solikhin

as

PRESENTER

In the 9th International Seminar on New Paradigm and Innovation on Natural Science and Its Application (9th ISNPINSA)

Held on 22 October 2019 at Gets Hotel, Semarang, Indonesia
with paper entitled as follows:

Weakly Compact Linear Operators on Space Of Dunford Integral Function

DEAN OF FSM UNDIP

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

9th ISNPINSA COMMITTEE CHAIRMAN

Dr. Suryono, M.Si
NIP. 19730630199802100 1