

REPORT OF “MATHEMATICAL ANALYSIS” DEPARTMENT ON SCIENTIFIC AND SCIENTIFIC ACTIVITY FOR 2019

The staff of “Mathematical Analysis” department consists of 11 research associates, including 4 doctor of sciences, professor, one corresponding member of ANAS.

1. Vagif Guliyev – head of department (doct. phys. math. sci. prof. Corr. member of ANAS).
2. Rovshan Bandaliyev- sen. res. ass. (doct. math. sci. prof. of ANAS).
3. Elman Ibrahimov – cand. phys. math. sci., ass. prof., lead. res. ass.
4. Hajibeyov Mubariz- cand. phys. math. sci., ass. prof., lead. res. ass.
5. Zaman Safarov - cand. phys. math. sci., ass. prof., lead. res. ass.
6. Elmira Hajiyeva – cand. phys. math. sci., res. ass.
7. Mehriban Omarova – ph. doctor in math., sen. res. ass.
8. Lala Aliyeva - ph. doctor in math., sen. res. ass.
9. Fatayi Isayev – cand. phys. math. sci., res. ass.
10. Aytekin Abdullayeva – cand. phys. math. sci., res. ass.
11. Aynur Mammadova – res. ass.

I. SCIENTIFIC PART

In 2019, according to the affirmed plan, six scientific works on the themes of “Modern problems of harmonic analysis” are carried out.

Work 1: Boundedness criterions of generalized potentials in Orlicz and Orlicz-Morrey-type spaces.

Executors: Head of department, corr. member of ANAS, prof. V.S. Guliyev, ph. doctor in math., ass. prof., sen. res. ass. M.N. Omarova

Boundedness criterions of generalized potentials in Orlicz and Orlicz-Morrey-type spaces are carried out Boundedness criterions of generalized fractional maximal and integral operators in Orlicz and Orlicz-Morrey-type spaces was obtained. Consequently, sufficient and necessary conditions on Orlicz and Orlicz-Morrey-type spaces was proved for boundedness of generalized fractional maximal and integral operators. Based on the results of researches , the following papers were published.

1. V.S. Guliyev, Fatih Deringoz, S.G Hasanov, *Fractional maximal function and its commutators on Orlicz spaces*, **Analysis and Mathematical Physics** 9 (1) (2019), 165–179. (WoS, IF-1.792) Q1
2. V.S. Guliyev, A. Ghorbanalizadeh, Y. Sawano, *Approximation by trigonometric polynomials in variable exponent Morrey spaces*, **Analysis and Mathematical Physics**, 9 (3) (2019), 1265-1285. (WoS, IF-1.792) Q1
3. V.S. Guliyev, J.J. Hasanov, X.A. Badalov, *Commutators of Riesz potential in the vanishing generalized weighted Morrey spaces with variable exponent*, **Mathematical Inequalities and Applications**, 22 (1) (2019), 331-351. (WoS, IF-1.083) Q1
4. V.S. Guliyev, T. Gadjiev, Sh. Galandarova, *Regularity in generalized Morrey spaces of solutions to higher order nondivergence elliptic equations with VMO coefficients*, **Electronic Journal of Qualitative Theory of Differential Equations** 2019, No. 55, 1–17; (WoS, IF-1.065) Q1
5. V.S. Guliyev, Ismail Ekincioglu, Esra Kaya, Z. Safarov, *Characterizations for the fractional maximal commutator operator in generalized Morrey spaces on Carnot group*, **Integral Transforms Special Functions** 30 (6) (2019), 453–470. (WoS, IF-0.812) Q2
6. R.A. Bandaliyev, V.S. Guliyev, I.G. Mamedov, Y.I. Rustamov, *Optimal Control Problem for Bianchi Equation in Variable Exponent Sobolev Spaces*, **Journal of Optimization Theory and Applications (JOTA)**, 180 (1) 2019, 303-320. (WoS, IF-1.234) Q2
7. V.S. Guliyev, F. Deringoz, E. Nakai, Y. Sawano, M. Shi, *Generalized fractional maximal and integral operators on Orlicz and generalized Orlicz-Morrey spaces of the third kind*, **Positivity**, 23 (3) (2019), 727-757. (WoS, IF-0.883) Q2
8. V.S. Guliyev, E. Ibrahimov, *Necessary and sufficient conditions for the boundedness of the Gegenbauer potential*, **Mat. Zametki** 105 (5) (2019), 685-695; translation in **Mathematical Notes** 105 (5) (2019), 37-46 (WoS, IF-0.577) Q3.
9. R.A. Bandaliyev, V.S. Guliyev, *Embedding theorems between variable exponent Morrey spaces*, **Mathematical Notes** 106 (4) (2019), 488-500. (WoS, IF-0,612) (Q3).
10. A. Eroglu, G.A. Abasova, V.S. Guliyev, *Characterization of parabolic fractional integral and its commutators in parabolic generalized OrliczMorrey spaces*, **Azerbaijan Journal of Mathematics**, 9 (1) (2019), 92-107. (WoS, ESCI)
11. V.S. Guliyev, A. Akbulut, S. Celik, M.N. Omarova, *Higher order Riesz transforms related to Schrodinger type operator on local generalized Morrey spaces*, **TWMS J. Pure Appl. Math.** 10 (1), 2019, 58-75. (WoS, ESCI)

12. V.S. Guliyev, E. Ibrahimov, *Necessary and sufficient conditions for the boundedness of the Gegenbauer-Riesz potential in modified Morrey spaces*, **Trans. A. Razmadze Mathematical Institute**, 173 (1) (2019), 37-52. (WoS, ESCI)
13. V.S. Guliyev, A. Eroglu, G.A. Abasova, *Characterization of parabolic fractional maximal function and its commutators in Orlicz spaces*, **Springer Proceedings in Mathematics and Statistics : Modern Methods, Problems and Applications of Operator Theory and Harmonic Analysis**, vol. 291 (2019), 35-49.
14. V.S. Guliyev, E. Ibrahimov, *Non-singular integral operators generated by Gegenbauer differential operator on generalized Morrey spaces*, **Nakhchivan Teacher-Training Institute News**, 2019, no. 2, 129-144.
15. E. Ibrahimov, V.S. Guliyev, S.A. Jafarova, *On boundedness of fractional maximal function and Riesz-Gegenbauer potential generated by Gegenbauer differential operator*, **Trans. A. Razmadze Math. Inst.**, 173(3), 2019, 347-362. (WoS, ESCI, SCOPUS)
16. V.S. Guliyev, M.N. Omarova, L. Softova, *The dirichlet problem in a class of generalized weighted morrey spaces*, **Proc. Inst. Math. Mech. Natl. Acad. Sci. Azerb.** 45 (2), 270-285-16 (2019). (WoS-SCOPUS)
17. V.S. Guliyev, T.S. Gadjiev, A. Serbetci, *The Dirichlet problem for the uniformly higher-order elliptic equations in generalized weighted Sobolev-Morrey spaces*, **Nonlinear Studies**, 26 (4) (2019), 831-842. (SCOPUS)
18. M.N. Omarova, *Parabolic nonsingular integral in Orlicz spaces*, **Trans. Natl. Acad. Sci. Azerb. Ser. Phys.-Tech. Math. Sci. Mathematics**, 39 (1), **Mathematics** 162-169 (2019). **SCOPUS**
19. M.N. Omarova, *Characterizations for the parabolic nonsingular integral operator on parabolic generalized Orlicz-Morrey spaces*, **Trans. Natl. Acad. Sci. Azerb. Ser. Phys.-Tech. Math. Sci. Mathematics**, 39 (4), **Mathematics** 1-11 (2019). **SCOPUS**

Theses

20. V.S. Guliyev, *Characterizations of fractional integral operator and its commutators in generalized Orlicz-Morrey spaces on Carnot groups*, **Modern methods, problems and applications of operator theory and harmonic analysis IX, Rostov-on-Don, 22 - 26 April, 2019**, pp. 1. (**plenary**)
21. V.S. Guliyev, *Generalized Orlicz-Morrey regularity for nondivergent elliptic equations with VMO coefficients*, **Operators, Functions, and Systems of Mathematical Physics Conference (OFSMPC), Khazar University, Baku, Azerbaijan, 10-14 June 2019**, pp. 1. (**plenary**)

22. V.S. Guliyev, *Maximal and singular integral operators and their commutators in variable exponent generalized weighted Morrey spaces*, International Conference on “Mathematics and Mathematics Education”, June 11-13, 2019, Selcuk University, Konya, TURKEY (**plenary**)
23. V.S. Guliyev, *Riesz potential and its commutators in variable exponent generalized weighted Morrey spaces*, International conference “Operators in general Morrey-type spaces and applications” during 17-19 July 2019 in Dumlipinar University, Kutahya, TURKEY, pp. 7. (**plenary**)
24. V.S. Guliyev, *Riesz potential and its commutators in variable exponent vanishing generalized weighted Morrey spaces*, Abs. Inter. Conf. "Mod. Prob. Math. Mech"ded. 60-th ann. Inst. Math. Mech. Natl. Acad. Sci., 23-25 October, Baku, Azerbaijan, p.219.
25. M.N. Omarova, *Fractional integral associated with Schrödinger operator on vanishing generalized Morrey spaces*, International conference “Operators in general Morrey-type spaces and applications” during 17-19 July 2019 in Dumlipinar University, Kutahya, TURKEY, pp. 65.
26. M.N. Omarova, *Global regularity in Orlicz-Morrey spaces of solutions to parabolic equations with VMO coefficients*, Abs. Inter. Conf. "Mod. Prob. Math. Mech"ded. 60-th ann. Inst. Math. Mech. Natl. Acad. Sci., 23-25 October, Baku, Azerbaijan, p.412.

Work 2: Boundedness criterions of Hausdorff operators on variable exponent Lebesgue spaces.

Executors: sen. res. ass. (doct. math. sci. prof. of ANAS) Rovshan Bandaliyev., cand. phys. math. sci., ass. prof., lead. res. ass Zaman Safarov

With regards to affirmed plan , boundedness of the Hausdorff operator was investigated for various types of Lebesgue spaces.

Based on the results of researches , the following papers were published.

1. R.A. Bandaliyev, P. Gorka, *Hausdorff operator in Lebesgue spaces*, **Math. Inequal. Appl.**, 22 (2) (2019), 657-676 (**WoS, IF-1,083**) (**Q1**).
2. R.A. Bandaliyev, S.S. Volosivets, *Hausdorff operator on weighted Lebesgue and grand Lebesgue p -adic spaces*, **p-Adic Num. Ultramet. Anal. Appl.** 11 (2) (2019), 114-122 (**WoS, ESCI**).
3. R.A. Bandaliyev, V.S. Guliyev, I.G. Mamedov, Y.I. Rustamov, *Optimal control problem for Bianchi equation in variable exponent Sobolev spaces*, **J. Optim. Theory Appl.** 180 (1) (2019), 303-320 (**WoS, IF-1,6**) (**Q2**).

4. R.A. Bandaliyev, V.S.Guliyev, *Embedding theorems between variable exponent Morrey spaces*, **Math. Notes**, **106** (4) (2019), 488-500. (WoS, IF-0,612) (Q3).
5. M.J. Mardanov, T.K. Melikov, R.A. Bandaliyev, I.G. Mamedov, *On the correct solvability of the Neumann problem for the generalized Mangeron equation with nonsmooth coefficients*, **Differ. Equ.**, **55** (10) (2019), 733-743 (WoS, IF-0,659) (Q3).

Theses

1. R. Bandaliyev, P. Górká. *On the boundedness and compactness of multidimensional Hausdorff operator in weighted Lebesgue spaces*. Abs. VIII Inter. Conf. "Modern Meth., Prob. Appl. Oper. Theory & Harm. Anal." 21-26 April, 2019, Rostov-on-Don, Russia, p.104.
2. R.A. Bandaliyev, *On Hardy inequality in variable Lebesgue spaces with mixed norm*. Abst. Inter. Conf. "Oper. Func. Syst. Math. Phys. Conf", Baku, 2019, 10-14 June, p. 34.
3. R.A. Bandaliyev, P. Górká, V.S. Guliyev, *Relatively compact sets in variable exponent Morrey spaces on metric spaces*. Abs. Inter. Conf. Oper. Gen. Morrey-Type Spaces and Appl., Kutahya Dumlupinar Univ., 16-20 July 2019, Kutahya, Turkey, p.3.
4. R.A. Bandaliyev, P. Górká and V.S. Guliyev, *On precompact sets in Morrey spaces*, Abs. Inter. Conf. "Mod. Prob. Math. Mech" ded. 60-th ann. Inst. Math. Mech. Natl. Acad. Sci., 23-25 October, Baku, Azerbaijan, p.153.

Work 3: The boundedness of generalized potentials on Orlicz spaces.

Executors: cand. phys. math. sci., ass. prof., lead. res. ass Hajibeyov Mubariz. , cand. phys. math. sci., res. ass Elmira Hajiyeva

This year boundedness of generalized potentials from variable exponential Lebesgue spaces to generalized Orlicz spaces (Musielac-Orlicz) was investigated. The main difference of given paper from so far investigated studies is repudiation from determined dual conditions.

1. M.G. Hajibayov, *The Welland inequality on hypergroups*, **Methods of Functional Analysis and Topology**, **25** (2) (2019), 134–141 (WoS, ESCI).

Theses

1. M.G. Hajibayov, *The Welland inequality on hypergroups*, International conference "Operators in general Morrey-type spaces and applications" during 17-19 July 2019 in Dumlupinar University, Kutahya, TURKEY, pp. 70.
2. M.G. Hajibayov, *Boundedness in variable exponent spaces of generalized potential operators given on nonhomogeneous spaces*, Abs. Inter. Conf. "Mod. Prob. Math.

Mech”ded. 60-th ann. Inst. Math. Mech. Natl. Acad. Sci.,23-25 October, Baku, Azerbaijan, pp.227-228.

Work 4: The boundedness of Riesz potential generated by Gegenbauer differential operator in Morri spaces.

Executors: cand. phys. math. sci., ass. prof., lead. res. ass Elman Ibrahimov

With regards to affirmed plan, Gegenbauer differential operator $G_\lambda = (x^2 - 1)^{\frac{1}{2}-\lambda} \frac{d}{dx} (x^2 - 1)^{\lambda+\frac{1}{2}} \frac{d}{dx}$ generated by Gegenbauer-Riesz potential I_G^α (G-Riesz potential) was studied. Based on the results of researches , the following papers were published.

Articles

1. V.S. Guliyev, E. Ibrahimov, *Necessary and sufficient conditions for the boundedness of the Gegenbauer potential*, **Mat. Zametki** 105 (5) (2019), 685-695; translation in **Mathematical Notes** 105 (5) (2019), 674-683 (impact factor 0.577)
2. V.S. Guliyev, E. Ibrahimov, *Necessary and sufficient conditions for the boundedness of the Gegenbauer-Riesz potential in modified Morrey spaces*, **Trans. A. Razmadze Mathematical Institute**, 173 (1) (2019), 37-52.
3. V.S. Guliyev, E. Ibrahimov, *Non-singular integral operators generated by Gegenbauer differential operator on generalized Morrey spaces*, **Nakhchivan Teacher-Training Institute News**, 2019, no. 2, 129-144.

Theses

4. E.J. Ibrahimov, G.A. Dadashova, *Some weighted inequalities G - fractional integrals*, Abs. Inter. Conf. "Mod. Prob. Math. Mech”ded. 60-th ann. Inst. Math. Mech. Natl. Acad. Sci.,23-25 October, Baku, Azerbaijan, p.260.

Work 5 : Two-weighted inequalities for the commutator of B-Riss potential.

Executors: ph. doctor in math., sen. res. ass. Lala Aliyeva , cand. phys. math. sci., res. ass. Fatayi Isayev

Two-weighted inequalities for the commutator of B-Riss potential is investigated. In addition, computation function being from Lipchitz and BMO spaces is obtained as both sufficient and necessary condition for the boundedness of commutator of Riss potential generated by Laplace-Bessel differential operator in Lebesgue space. Moreover ,the boundedness and local properties of

singular operator on oscillation spaces and some embedding theorems for Besov, Komponato spaces were proved. Green function for Bessel-Helmholtz equation was found.

1. F.A. Isayev, Weighted inequality for (p, q) -admissible B-potential operators, International conference "Operators in general Morrey-type spaces and applications" during 17-19 July 2019 in Dumlipinar University, Kutahya, TURKEY, pp. 72.
2. F.A. Isayev, Weighted inequality for $B_{k,n}$ fractional integral, Abs. Inter. Conf. "Mod. Prob. Math. Mech"ded. 60-th ann. Inst. Math. Mech. Natl. Acad. Sci.,23-25 October, Baku, Azerbaijan, p.263.
3. A.E. Abdullayeva, L.R.Alieva, Approximation of Functions by Linear Positive Operators in Variable Exponent Lebesgue Spaces, International conference "Operators in general Morrey-type spaces and applications" during 17-19 July 2019 in Dumlipinar University, Kutahya, TURKEY, pp. 55.
4. L.R.Alieva, "Oscillatory integral operator on Lebesgue spaces with variable exponent", An International Workshop dedicated to the 80-th anniversary of an academician Mirabbas Geogja oglu Gasymov, Spectral theory and its Applications, p 43-44, Baku/June 7-8, 2019
5. Алиева Л.Р. О свойствах сингулярного интеграла, Azərbaycan xalqının ümummilli lideri Heydər Əliyevin 96-cı ildönümünə həsr olunmuş "Riyaziyyat və mexanikanın aktual problemləri", 6-7 May, 2019, Bakı, Azərbaycan, pp.18
6. L.R.Aliyeva, Solution of a boundary value problem for the Bessel-Helmholtz equation, Abs. Inter. Conf. "Mod. Prob. Math. Mech"ded. 60-th ann. Inst. Math. Mech. Natl. Acad. Sci.,23-25 October, Baku, Azerbaijan, pp. 113-115.

Work 5 : Some approximation theorems on Lebesgue spaces.

Executors: cand. phys. math. sci., res. ass. AYTEKIN Abdullayeva res. ass. AYNUR Mammadova

On weighted Lebesgue space, new modulus of continuity was introduced and studied properties. Obtained results was given to publish in the form of an article. In general, an analogue of classic Popovic's theorem for both Szász operator and Bernstein-Khlovdovsky polynomial was obtained by A.N. Mammadova, A.E. Abdullayeva. And theorem is being researched in Varenokaya type asymptotic $L_p(1 < p < \infty)$ space. Some properties of modulus of weighted continuity was proved.

1. A.E. Abdullayeva, L.R.Alieva, Approximation of Functions by Linear Positive Operators in Variable Exponent Lebesgue Spaces, International conference “Operators in general Morrey-type spaces and applications” during 17-19 July 2019 in Dumlipinar University, Kutahya, TURKEY, pp. 55.
2. A.N. Mammadova, D.R. Aliyeva, On properties of weighted Lebesgue modulus of continuity, International conference “Operators in general Morrey-type spaces and applications” during 17-19 July 2019 in Dumlipinar University, Kutahya, TURKEY, pp. 54.
3. A.N. Mammadova, On approximation theorem in weighted Lebesgue spaces, Abs. Inter. Conf. "Mod. Prob. Math. Mech"ded. 60-th ann. Inst. Math. Mech. Natl. Acad. Sci.,23-25 October, Baku, Azerbaijan, p.346.
4. A.E. Abdullayeva, On convergence of Bernstein-Chlodowsky-Kantrovich operators sequence in variable Lebesgue spaces, Abs. Inter. Conf. "Mod. Prob. Math. Mech"ded. 60-th ann. Inst. Math. Mech. Natl. Acad. Sci.,23-25 October, Baku, Azerbaijan, p.53.

II SCIENTIFIC ORGANIZATIONAL ACTIVITY

- The main priority of the department is modern problems of harmonic analysis.

- In the department the research works are carried out on 6 themes.

- The department staff consists of 17 collaborators. One of them is a professor (corr. member of ANAS), one doctor of sciences (professor of ANAS), 4 associate professor, 1 senior res. ass., 4 res. ass., 2 engineer programmer, 2 senior laboratory assistants, 3 laboratory assistants.

- Prof. V.S. Guliyev, doc. R.A. Bandaliyev, doc. E.C. İbrahimov, ph.d. F.A. İsayev, ph.d. M.N. Omarova, ph.d. L. Aliyeva, A.E. Abdullayeva, A.N. Mammadova regularly take part in the institute seminars.

In addition, doc. R.A. Bandaliyev and doc. O.Q.Azizov delivered lectures about “Boundedness of the Hausdorff operator on weighted Lebesgue spaces “ and “Single and double layers potentials on smooth and nonsmooth surfaces “ in the instute seminar which was held on 06.02.2019 and 18.09.2019 respectively .

- The seminar "Actual problems of harmonic analysis" led by prof.V.S.Guliyev is held every friday of the week. Prof.V.S.Guliyev, prof. of ANAS R.A.Bandaliyev, ass prof. M.N.Omarova, A.E.Abdullayeva, A.N.Mammadova have given presentations in these seminars.Furthermore, additional scientific seminar held once a week also continues its activity.

- In 2019, necessary and sufficient conditions for boundedness of integral operators of newly considered functional spaces, new results connected with their application to theory of

differential equations and other important results associated with harmonic analysis's actual problems were obtained by V.S. Guliyev. These results were published as 15 articles in journals from "Thomson Reuters" list and 10 papers were accepted for publication in journals from "Thomson Reuters" list.

- In 2019, member of the the citations in MathSciNet mathematical Review is 200, in Google Scholar is 315. Prof. V.S. Guliyev's papers were used scientific studies of various scientists. (A.Torchinsky, H.Triebel, E.Nakai, S.Samko, V. Kokilashvili, Kwok-Pun Ho, M.A. Ragusa, Y. Sawano, W. Sickel, T. Shimomura, T. Ohno, D. Palagachev, S. Byun and etc.

- Under the management of prof.V.S. Guliyev the international conference entitled "Operators in General Morrey-Type Spaces and Applications – OMTSA 2019" hosted by Turkey at Dumlupınar University was held successfully on 16-20 April, 2019. Moreover, he was a director's assistant in international conference "Modern problems of Mathematics and Mechanics" devoted to 60th anniversary of the Institute of Mathematics and Mechanics. V.S.Guliyev has given lectures as an invited lecturer in international conferences of a number of countries.

- On 23-26 April, 2019, in the international conference entitled "Modern Methods, Problems and Applications of Operator Theory and Harmonic Analysis IX" hosted by Russia at Southern Federal University, V.S.Guliyev participated as a plenary lecturer with his talk "Characterizations of fractional integral operator and its commutators in generalized Orlicz-Morrey spaces on Carnot groups".

- On 10-14 June, 2019 in the international conference "Operators, Functions, and Systems of Mathematical Physics Conference" hosted by Khazar University, he participated with the plenary lecture "*Generalized Orlicz-Morrey regularity for nondivergent elliptic equations with VMO coefficient*".

- V.S. Guliyev participated as a plenary lecturer with his talk "*Maximal and singular integral operators and their commutators in variable exponent generalized weighted Morrey spaces*" on 11-13 July, 2019, in the international conference "Mathematics and Mathematics Education" hosted by Turkey, Konya.

- On 16-20 April, 2019, in the international conference entitled "Operators in General Morrey-Type Spaces and Applications – OMTSA 2019" hosted by Turkey at Dumlupınar University, he participated with the plenary lecture "*Riesz potential and its commutators in variable exponent generalized weighted Morrey spaces*".

- In 2019 he has continued his activity as a member of the The High Attestation Commission under the President of the Republic of Azerbaijan.

- He is a reviewer of the Science Development Foundation under the President of the Republic of Azerbaijan.

- In 2019, two issues of "Transaction of ANAS, Mathematics issue "(phys. tech. math. ser) (39(1), 2019, june) and (39(4), 2019, december) published. In 2018, "Transaction of ANAS, Mathematics issue " (phys. tech. math. ser) was adopted to SCOPUS base.

He is a member of the editorial board of "Azerbaijan journal of Mathematics", "Proceedings of Institute of Mathematics and Mechanics of NAS of Azerbaijan", "Applied and Computational Mathematics" and foreign journals "Eurasian Mathematical Journals", "Communications de la Faculté des Sciences de l'Université d'Ankara.Séries A1.Mathematics and Statistics", "Journal of Nonlinear Sciences and Applications (J.Nonlinear Sci.Appl.)", "International Journal of Mathematical Physics" and continues his activity as one of the editor-in-chiefs on "Caspian journal of Applied Mathematics, Ecology and Economics". He was a reviewer of the papers from "Journal of Mathematical Analysis and Application, Mathematische Nachrichten, Journal of Fourier Analysis and Application, Journal of Mathematical Inequalities, Integral transform and Special Functions, Journal of Function Spaces, Communications in

Mathematical Analysis, Complex Variables and Elliptic Equations, Journal of Inequalities and Applications, Collectanea Mathematica" and other impact factor journals.

Prof.V.S.Guliyev's article " *Fractional maximal function and its commutators on Orlicz spaces* " which published in high impact factor 1.792 journal Q1" Analysis and Mathematical Physics" for its sufficient high reference ranking about 1% was included in international base "Clarivate Analytics" (Thomson Reuters) consisting of best ranking reference about Mathematics on May/June 2019.

The number of citations to Vagif Guliyev's papers in MathSciNet reviews is 986 (838); in Google Scholar is 2887 (2402).

1. Journal of Mathematical Analysis and Applications (IF –1,014), **Q1**
2. Analysis and Mathematical Physics (IF –1,792) **Q1**
3. Mediterranean Journal Of Mathematics **Q1**
4. Mathematische Nachrichten (IF –0,847) **Q1**
5. Journal of Mathematical Inequalities (IF –1,158), **Q1**
6. Mathematical Inequalities and Applications (IF –1,083), **Q1**
7. Integral Transforms And Special Functions (IF – 0.812), **Q2**
8. Positivity (IF – 0.833), **Q2**

9. Journal of Function Spaces (IF – 1.005); **Q2**
10. Complex Variables and Elliptic Equations (IF – 0.806); **Q2**
11. Journal of Inequalities and Applications (IF –1,136), **Q1**
12. Studia Mathematica (IF –0,750) **Q2**
13. Mathematical Methods in the Applied Sciences (IF –1,533), **Q2**
14. Ukrain Matematical Journals (IF –0,189)
15. Boundary Value Problems (IF –1,156) **Q1**
16. Turkish Journal of Mathematics (IF –0,311)
17. Korean journal of mathematics (WoS)

In the reporting period, Sen. res. ass, doct. math. sci prof. of AMEA R.A. Bandaliyev has given talks in the seminars of "Mathematical Analysis". On 12-28 April 2018 he has participated with the topic " On the boundedness and compactness of multidimensional Hausdorff operator in weighted Lebesgue spaces" in the "Hausdorff operator and related topics" section of the international "Modern methods, Problems and Applications of Operator theory and Harmonic Analysis " Conference which was held in Rostov city . During this Conference had discussion with prof. S.G. Samko, prof. M.L. Qoldman, prof. V.D. Stepanov (Russia), prof.E. Liflyand (İsrael) and V.İ. Burenkov (Russia), Y. Savano (Japan), H. Rafeiro (Columbia) and others. Some discussion were carried out obtainity analogue of the classic Riesz-Kolmogorov compactness theorem in variable exponent Morrey space. In the another conference was held on 16-20 July 2019 " OMTSA 2019" hosed by Turkey,Kütahya he has given a talk on " Relatively compact sets in variable exponent Morrey spaces on metric spaces ". During this conference he has some discusion with prof. A.Gogatishvili, prof. M. Ragusa, prof. P. Gorka, prof. P. Jain, prof. S. Polidoro and etc. The report made on the conference was accepted as article for publication. In additional, he has given a talk "On precompact sets in Morrey spaces" at " in international coference "Modern problems of Mathematics and Mechanics" devoted to 60th anniversary of the İnstitute of Mathematics and Mechanics.During reporting period he was elected the chairman of the Council of professors of ANAS. Currently, one master and one candidate for a degree has defended Phd dissertation on mathematics under his supervision.

M.G. Hajibayov has a plenary lecturer has given a talk on the another conference was held on 16-20 July " OMTSA 2019 " hosed by Turkey, Kütahya .

Defenses

In 2019 , A.E. Abdullayeva has received PhD in mathematics.

Lead. res. ass Mubariz Hajibayov has been awarded professor of ANAS.

The sen. res. ass Lale Aliyeva has been awarded the diploma of docent of High Attestation Commission by the President of the Republic of Azerbaijan.

Publications

In the second quarter of annual report, 23 scientific articles (19 of them on Web of Sciences's list) and 24 theses of departament staff were published, 10 paper were accepted for publication, 15 of them are presented to publication.

Head of the department
“Mathematical Analysis”

Corr. member of NASA,
prof.V.S. GULIYEV

№	The name of the job	Type of work	Publishing, journal and so.	Volume of work	Co-authors
1	2	3	4	5	6
Prof. V.S. Guliyev					
1.	Characterizations for the fractional maximal commutator operator in generalized Morrey spaces on Carnot group	Article	Integral Transforms Spec. Funct. 30 (6) (2019), 453–470. (WoS, IF-0.812) Q2	18 səh.	I.Ekincioglu E.Kaya Z. Safarov
2.	Commutators of Riesz potential in the vanishing generalized weighted Morrey spaces with variable exponent	Article	Mathematical Inequalities and Applications, 22 (1) (2019), 331-351. (impact factor 0.649) Q3 (WoS, IF-1.083) Q1	21 səh.	J.J. Hasanov X.A. Badalov
3.	Optimal Control Problem for Bianchi Equation in Variable Exponent Sobolev Spaces	Article	Journal of Optimization Theory and Applications (JOTA), 180 (1) 2019, 303-320. (WoS, IF-1.234) Q2	18 səh.	R.A. Bandaliyev I.G. Mamedov Y.I. Rustamov
4.	Characterization of parabolic fractional integral and its commutators in parabolic generalized OrliczMorrey spaces	Article	Azerbaijan Journal of Mathematics, 9 (1) (2019), 92-107. (WoS, ESCI)	16 səh.	A. Eroglu G.A. Abasova
5.	Fractional maximal function and its commutators on Orlicz spaces	Article	Anal. Math. Phys. 9 (2019), no. 1, 165–179. (WoS, IF-1.792) Q1	15 səh.	Fatih Deringoz S.G Hasanov
6.	Higher order Riesz transforms related to Schrodinger type operator on local generalized Morrey spaces	Article	TWMS J. Pure Appl. Math. 10 (1), 2019, 58-75. (WoS, ESCI)	18 səh.	A. Akbulut S. Celik M.N. Omarova
7.	Generalized fractional maximal and integral operators on Orlicz and generalized Orlicz-Morrey spaces of the third kind	Article	Positivity, 23 (3) (2019), 727-757. (WoS, IF- 0.883) Q2	31 səh.	F. Deringoz E. Nakai Y. Sawano M. Shi

8.	Regularity in generalized Morrey spaces of solutions to higher order nondivergence elliptic equations with VMO coefficients	Article	Electronic Journal of Qualitative Theory of Differential Equations 2019, No. 55, 1–17; (WoS, IF-1.065) (WoS, IF-1.065) Q1	17 səh.	T. Gadjiev Sh.Galandarova
9.	Approximation by trigonometric polynomials in variable exponent Morrey spaces	Article	Analysis and Mathematical Physics, 9 (3) (2019), 1265-1285. (WoS, IF-1.792) Q1	21 səh.	A.Ghorbanaliza deh, Y. Sawano
10.	Characterization of parabolic fractional maximal function and its commutators in Orlicz spaces	Article	Springer Proceedings in Mathematics and Statistics : Modern Methods, Problems and Applications of Operator Theory and Harmonic Analysis, vol. 291 (2019), 35-49.	15 səh.	A. Eroglu, G.A. Abasova
11.	Embedding theorems between variable exponent Morrey spaces	Article	Mathematical Notes 106 (4) (2019), 488-500. (WoS, IF-0,612) (Q3).	13 səh.	R.A. Bandaliyev
12.	Necessary and sufficient conditions for the boundedness of the Gegenbauer-Riesz potential in modified Morrey spaces	Article	Trans. A. Razmadze Mathematical Institute , 173 (1) (2019), 37-52. (WoS, ESCI)	16 səh.	E. Ibrahimov
13.	The Dirichlet problem for the uniformly higher-order elliptic equations in generalized weighted Sobolev-Morrey spaces	Article	Nonlinear Studies , 26 (4) (2019), 831-842.	12 səh.	T.S. Gadjiev A. Serbetci
14.	On boundedness of fractional maximal function and Riesz-Gegenbauer potential generated by Gegenbauer differential operator	Article	Trans. A. Razmadze Math. Inst., 173(3), 2019, 347-362. (WoS, ESCI, SCOPUS)	16 səh.	E. Ibrahimov S.A. Jafarova

15.	The dirichlet problem in a class of generalized weighted morrey spaces	Article	Proc. Inst. Math. Mech. Natl. Acad. Sci. Azerb. 45 (2), 270-285-16 (2019). (WoS-SCOPUS)	16 səh.	M.N. Omarova L. Softova
16.	Characterizations of fractional integral operator and its commutators in generalized Orlicz-Morrey spaces on Carnot groups	Thesis	Modern methods, problems and applications of operator theory and harmonic analysis IX, Rostov-on-Don, 22 - 26 April, 2019, pp. 1. (plenar)	1 səh.	-
17.	Generalized Orlicz-Morrey regularity for nondivergent elliptic equations with VMO coefficients	Thesis	Operators, Functions, and Systems of Mathematical Physics Conference (OFSMPC), Khazar University, Baku, Azerbaijan, 10-14 June 2019, pp. 1. (plenar)	1 səh.	-
18.	Maximal and singular integral operators and their commutators in variable exponent generalized weighted Morrey spaces	Thesis	International Conference on "Mathematics and Mathematics Education", June 11-13, 2019, Selcuk University, Konya, TURKEY (plenar)	1 səh.	-
19.	Riesz potential and its commutators in variable exponent generalized weighted Morrey spaces	Thesis	International conference "Operators in general Morrey-type spaces and applications" during 17-19 July 2019 in Dumlipinar University, Kutahya, TURKEY, pp. 7. (plenar)	1 səh.	-
20.	Riesz potential and its commutators in variable exponent vanishing generalized weighted Morrey spaces	Thesis	Abs. Inter. Conf. "Mod. Prob. Math. Mech" ded. 60-th ann. Inst. Math. Mech. Natl. Acad. Sci., 23-25 October, Baku, Azerbaijan,	1 səh.	-

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Dos. R.A. Bandaliyev					
1.	Hausdorff operator in Lebesgue spaces	Article	Math. Inequal. Appl. 22(2), 2019, 657-676. (TR-IF-0.649)	20 səh.	P. Gorka
2.	Hausdorff operator on weighted Lebesgue and grand Lebesgue p – adic spaces	Article	p – Adic Numbers Ultrametric Anal. Appl., 11(2), 2019, 114-122.(TR- ESCI)	9 səh.	S.S. Volosivets
3.	On the boundedness and compactness of multidimensional Hausdorff operator in weighted Lebesgue spaces	Thesis	Proc. IX Inter. Conf. “Modern Meth. Prob. Appl. OTHA” Russia, Rostov-on-Don, 22-25 April, 2019, pp. 104	1 səh.	-
4.	On Hardy inequality in variable Lebesgue spaces with mixed norm	Thesis	Abst. Inter. Conf. “Oper. Func. Syst. Math. Phys. Conf”, Baku, 2019, 10-14 June, pp. 34.	1 səh.	-
5.	Relatively compact sets in variable exponent Morrey spaces on metric spaces	Thesis	International conference “Operators in general Morrey-type spaces and applications” during 17-19 July 2019 in Dumlipinar University, Kutahya, TURKEY, pp. 3. (plenary)	1 Səh.	-
6.	On precompact sets in Morrey spaces	Thesis	Abs. Inter. Conf. "Mod. Prob. Math. Mech"ded. 60-th ann. Inst. Math. Mech. Natl. Acad. Sci.,23- 25 October, Baku, Azerbaijan, p.153.	1 Səh.	P. Gorka, V.S. Guliyev
Dos. Elman İbrahimov					
1.	Necessary and sufficient		Mat. Zametki 105 (5)		

	conditions for the boundedness of the Gegenbauer potential	Article	(2019), 685-695; translation in Mathematical Notes 105 (5) (2019), 37-46 (impact factor 0.577) Q3.	10 səh.	V.S. Guliyev
2.	Non-singular integral operators generated by Gegenbauer differential operator on generalized Morrey spaces	Article	Nakhchivan Teacher-Training Institute News, 2019, no. 2, 129-144.	15 səh.	V.S. Guliyev
3.	Some weighted inequalities - fractional integrals	Thesis	Abs. Inter. Conf. "Mod. Prob. Math. Mech" ded. 60-th ann. Inst. Math. Mech. Natl. Acad. Sci., 23-25 October, Baku, Azerbaijan, p.260.	1 səh.	G.A. Dadashova
Dos. Mubariz Hacıbayov					
1.	The Welland inequality on hypergroups	Article	Methods of Functional Analysis and Topology, 25 (2) (2019), 134–141 (WoS, ESCI).	7 səh.	-
2.	The Welland inequality on hypergroups	Thesis	International conference "Operators in general Morrey-type spaces and applications" during 17-19 July 2019 in Dumlipinar University, Kutahya, TURKEY, pp. 70.	1 səh.	E.A. Gadjieva
3.	Boundedness in variable exponent spaces of generalized potential operators given on nonhomogeneous spaces	Thesis	Abs. Inter. Conf. "Mod. Prob. Math. Mech" ded. 60-th ann. Inst. Math. Mech. Natl. Acad. Sci., 23-25 October, Baku, Azerbaijan, pp.227-228.	1 səh.	-

Dos. Mehriban Omarova					
1.	Parabolic nonsingular integral in Orlicz spaces	Article	Trans. Natl. Acad. Sci. Azerb. Ser. Phys.-Tech. Math. Sci. Mathematics, 39 (1), 162-169 (2019).	8 səh.	-
2.	Characterizations for the parabolic nonsingular integral operator on parabolic generalized Orlicz-Morrey spaces	Article	Trans. Natl. Acad. Sci. Azerb. Ser. Phys.-Tech. Math. Sci. Mathematics, 39 (4), 55-65 (2019).	11 səh.	-
3.	Fractional integral associated with Schrödinger operator on vanishing generalized Morrey spaces, International conference	Thesis	“Operators in general Morrey-type spaces and applications” during 17-19 July 2019 in Dumlipinar University, Kutahya, TURKEY, pp. 65.	1 səh.	-
4.	Global regularity in Orlicz-Morrey spaces of solutions to parabolic equations with VMO coefficients	Thesis	Abs. Inter. Conf. "Mod. Prob. Math. Mech"ded. 60-th ann. Inst. Math. Mech. Natl. Acad. Sci., 23-25 October, Baku, Azerbaijan, p.412.	1 səh.	-
r.f.d. F.A. Isayev					
1.	Weighted inequality for (p, q)-admissible B-potential operators	Thesis	International conference “Operators in general Morrey-type spaces and applications” during 17-19 July 2019 in Dumlipinar University, Kutahya, TURKEY, pp. 72.	1 səh.	-
2.	Weighted inequality for $B_{k,n}$ fractional		Abs. Inter. Conf. "Mod. Prob. Math. Mech"ded. 60-		

	integral	Thesis	th ann. Inst. Math. Mech. Natl. Acad. Sci.,23-25 October, Baku, Azerbaijan, p.263.	1 səh.	-
r.f.d. L.R. Aliyeva					
1.	Approximation of Functions by Linear Positive Operators in Variable Exponent Lebesgue Spaces	Thesis	International conference “Operators in general Morrey-type spaces and applications” during 17-19 July 2019 in Dumlipinar University, Kutahya, TURKEY, pp. 55.	1 səh.	A.E. Abdullayeva
2.	Oscillatory integral operator on Lebesgue spaces with variable exponent	Thesis	An International Workshop dedicated to the 80-th anniversary of an academician Mirabbas Geogja oglu Gasymov, Spectral theory and its Applications, p 43-44, Baku/June 7-8, 2019	1 səh.	-
3.	О свойствах сингулярного интеграла	Thesis	Azərbaycan xalqının ümummilli lideri Heydər Əliyevin 96-cı ildönümünə həsr olunmuş "Riyaziyyat və mexanikanın aktual problemləri", 6-7 May, 2019, Bakı, Azərbaycan, pp.18	1 səh.	-
4.	Solution of a boundary value problem for the Bessel-Helmholtz equation,	Thesis	Abs. Inter. Conf. "Mod. Prob. Math. Mech”ded. 60-th ann. Inst. Math. Mech. Natl. Acad. Sci.,23-25 October, Baku, Azerbaijan, pp. 113-115.	1 səh.	-

r.f.d. A.E. Abdullayeva					
1.	Approximation of Functions by Linear Positive Operators in Variable Exponent Lebesgue Spaces	Thesis	International conference “Operators in general Morrey-type spaces and applications” during 17-19 July 2019 in Dumlipinar University, Kutahya, TURKEY, pp. 55.	1 səh.	L.R. Aliyeva
2.	On convergence of Bernstein-Chlodowsky-Kantrovich operators sequence in variable Lebesgue spaces,	Thesis	Abs. Inter. Conf. "Mod. Prob. Math. Mech"ded. 60-th ann. Inst. Math. Mech. Natl. Acad. Sci.,23-25 October, Baku, Azerbaijan, p.53.	1 səh.	-
r.f.d. A.N. Mammadova					
1.	On properties of weighted Lebesgue modulus of continuity	Thesis	International conference “Operators in general Morrey-type spaces and applications” during 17-19 July 2019 in Dumlipinar University, Kutahya, TURKEY, pp. 54.	1 səh.	D.R. Aliyeva
2.	On approximation theorem in weighted Lebesgue spaces	Thesis	Abs. Inter. Conf. "Mod. Prob. Math. Mech"ded. 60-th ann. Inst. Math. Mech. Natl. Acad. Sci.,23-25 October, Baku, Azerbaijan, p.346.	1 səh.	-

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