

## Laboratory of Mathematical Problems of Signal Processing

Institute of Mathematics and Mechanics,

Ministry of Science and Education

### BRIEF SEMI-ANNUAL REPORT ON SCIENTIFIC & ORGANIZATIONAL ACTIVITIES FOR THE 2024

During the reporting period 3 research works have been done in the field of "Application of modern mathematical methods to various identification problems" by the employees of the Laboratory of Mathematical Problems of Signal Processing.

There are 4 employees in the laboratory.

1. Sadigova Sabina Rahib kizi – Ph.D. , Associate Prof.
2. Zabidov Zakir Jumshud oglu - Ph.D.
3. Aliyeva Khayala Mammadaga kizi –junior research assistant
4. Mirzabalayeva Asmar Idris kizi- junior research assistant

During the reporting period, the laboratory staff published 2 scientific articles (WOS-2) and 4 theses in the proceedings of various international conferences.

#### Articles in journals included in the Web of Science and SCOPUS databases:

1. Bilal T. Bilalov, Sabina R. Sadigova, Yonca Sezer, Natavan P. Nasibova. On solvability of polyharmonic Dirichlet problem in symmetric Sobolev spaces. Math. Meth. Appl. Sci. 2024;1–16. DOI: 10.1002/mma.10279 (WOS, SCOPUS) **IF=2.1 (SCIE)**
2. Bilalov, B.T., Sadigova, S.R. & Softova, L.G. Higher order elliptic equations in weighted Banach spaces. Ann Univ Ferrara (2024). <https://doi.org/10.1007/s11565-024-00505-9> <https://link.springer.com/article/10.1007/s11565-024-00505-9#Ack1> (**SCOPUS**)

#### Abstracts

1. S.R. Sadigova,, N.P. Nasibova, Fredholmness of the Dirichlet problem for  $2m$ -th order elliptic equations in Grand Sobolev Spaces. XI International Scientific Conference “Modern Problems of Mathematics and Mechanics”, dedicated to the memory of the brilliant Azerbaijani scientist and thinker of the 13th century Nasireddin Tusi, July 03-06, 2024 in Baku, AZERBAIJAN, pp. 267-268
2. Umit Ildiz, S.R. Sadigov, On basicity of some trigonometric system in Banach function spaces. XI International Scientific Conference “Modern Problems of Mathematics and Mechanics”, dedicated to the memory of the brilliant Azerbaijani scientist and thinker of the 13th century Nasireddin Tusi, July 03-06, 2024 in Baku, AZERBAIJAN, pp. 333-335

3. Z.C. Zabidov, Kh.M. Gadirova, Assessment of physiological development stages of flowering of plants in the cultivated area using spectral analysis of images. XI International Scientific Conference “Modern Problems of Mathematics and Mechanics”, dedicated to the memory of the brilliant Azerbaijani scientist and thinker of the 13th century Nasireddin Tusi, July 03-06, 2024 in Baku, AZERBAIJAN, pp. 74

4. Z.C. Zabidov, Kh.M. Gadirova, A.I. Mirzebalayeva, Assessment of vegetation cover of territories using various indices. XI International Scientific Conference “Modern Problems of Mathematics and Mechanics”, dedicated to the memory of the brilliant Azerbaijani scientist and thinker of the 13th century Nasireddin Tusi, July 03-06, 2024 in Baku, AZERBAIJAN, pp. 75

<b>GRANTS</b>		
"Karabakh is Azerbaijan". grant competition by the Azerbaijan Science Foundation! (AEF-MQM-QA-1-2021-4(41)-8/02/1-M-02, 24.11.2022)	“Application of modern mathematical methods to the assessment of the current state and dynamics of agricultural fields according to spectral images”	Participants Zakir Zabidov and Xayala Aliyeva
"Main grant competition-2023" of the Azerbaijan Science Foundation dedicated to the 100th anniversary of the National Leader Heydar Aliyev (AEF-MCG-2023-1(43)-13/05/1-M-05, 17.11.2023)	On Fredholmness of the elliptic equations in grand Sobolev spaces	Participant Asmar Mirzabalayeva

#### **SUBMITTED PROJECT**

Space Agency of the Republic of Azerbaijan (Azercosmos)  Earth Observation Competition 2024	Evaluation of soil salinization in Kur-Araz lowland according to satellite data	Xayala Aliyeva  (manager)
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<b>PEDAGOGICAL ACTIVITIES</b>	
PhD, associate prof. Sabina Sadigova	Khazar University
Xayala Aliyeva	Khazar University

<b>Membership in organizing committees of international conferences</b>	
PhD, associate prof. Sabina Sadigova	7th International Conference on Mathematical Advances and Applications (7-th ICOMAA 2024), Istanbul, Turkey, 8-11 May, 2024

<b>SOCIAL ACTIVITIES</b>	
PhD, Associate Prof. Sabina Sadigova	<ul style="list-style-type: none"> <li>• Member of the Academic Council of the Institute of Mathematics and Mechanics;</li> <li>• Secretary of the Women's Council of the Institute of Mathematics and Mechanics;</li> <li>• Editorial Assistant of Azerbaijan Journal of Mathematics;</li> <li>• Executive Editor of Caspian Journal of Applied Mathematics, Ecology and Economics;</li> <li>• Editorial Assistant of Journal of Contemporary Applied Mathematics.</li> </ul>

**Head of the laboratory :**

**PhD, Associate Prof. Sabina Sadigova**