

## **On semi-annual report of “Computing mathematics and information science” department for 2017.**

In the reporting period, the department was working on the approved theme “Development of methodical bases of creation of program complexes for screen representation on three dimensional states phase of controlled trajectories” which included 4 independent research and development.

In the department there are 13 employees: 4 doctors of philosophy, 7 engineers of programmers, 2 laboratory assistants. Two employees conduct scientific research for the degree of Doctor of Sciences.

An internal seminar is systematically held every Wednesday at 11:00. Every Tuesday and Thursday, together with the department "Non-harmonic analysis", a seminar is held within the framework of the program "Application of frame theory and wavelet analysis for signal processing in seismology and other fields".

One scientific work in the journal with a high impact factor index was published. (A.G.Nagiev, V.V.Sadikhov, H.A.Nagiev. The Problem of Aperture Delay in Digital Measurement Systems and its Analytic Solution by the Matrix Exponential Method// Measurement Techniques» Springer USA- 2017, Volume 60, Issue 9, pp 874–880. IF=0.29). One scientific work was submitted for publication in the prestigious journal of Russia ("Journal of Technical Physics") and one article was accepted for publication ("Theoretical Foundations of Chemical Technology"). Together with this, the article " Orthogonality relation for the Charlier polynomials with respect to the continuous measure " was prepared with the scientific employee Aynura Jafarava and was accepted for publication in the journal "Journal of Baku Engineering University".

With the thesis of the report "The solution of the algebraic problem of obtaining a matrix exponent in the problem of accounting for time shifts in digital measurement channels" ( A.G.Nagiev, V.V.Sadikhov, G.A.Nagiev) participated in the International Conference "Operators, Functions, and Systems of Mathematical

Physics Conference, which was held in Baku at the Khazar University on May 21-24, 2018.

From May 11 to May 13, 2018, Aynura Jafarova, a research assistant, took part in the International Conference on Mathematical Advances and Applications (ICOMAA2018) in Turkey, with the thesis "On the superposition of states of the  $q$ -deformed quantum oscillator".

A thesis was sent for participation in the international conference "Technology, Culture and International Stability - 18th TECIS 2018", which will be held in Baku on September 13-15, 2018.

The project "Development of optimally controlled methods for nonlinear dynamic objects under the influence of harmonic and impulsive controls (using the example of oil refining processes)" was presented to the staff of the department. It was awarded in the framework of the Grant Contest of the Science Development Fund "Integration in Science and Education" (60 000 manat). The aim of the project is to study the positive effects and the development of appropriate methodologies, caused by non-stationary control effects, which are important properties of large-scale oil refining processes. The scientific idea of the project is the possibility of expanding the class of optimal management influences by using periodic regimes in industrial dynamic systems that take place due to the existence of a set of stationary states. At present, research has been launched. It is expected that as a result of the project, the efficiency of extraction of petroleum hydrocarbons will increase, which is of great importance in the oil refining industry of our republic.

Successfully conducted the guidance of trainees (all days of the week, 19 students of the Faculty of Applied Mathematics of ASOIU passed scientific and production practice). Employees of the department were attracted to both scientific and practical guidance of trainees. Student interns were divided into three groups, according to the topics:

- Creation of software for enterprise management processes in the field of queuing systems;
- Implementation of software for use in queuing systems in MS Visual Studio;
- Methods for solving equations of mathematical physics in the Matlab environment.

**Head of department:**

**doctor of philosophy in technology, associate professor      Hasan Nagiev**