

**ON THE PROGRESS OF THE ACTIVITIES OF PROJECT «IN SITU METHODS FOR SYNCHROTRON INVESTIGATIONS OF MULTILAYER FUNCTIONAL STRUCTURES WITH UNIQUE PARAMETERS AND PROPERTIES CREATED BY BEAM-PLASMA SURFACE ENGINEERING »<sup>1</sup>**

*V.V. DENISOV, N.N. KOVAL, N.A. RATAKHIN, A.N. SHMAKOV, A.D. TERESOV*

*Institute of High Current Electronics SB RAS, 2/3 Akademicheskoy ave., Tomsk, 634055, Russia, e-mail: denisov@opee.hcei.tsc.ru, Tel. +7(3822)492683*

Accelerating the process of creating of new materials with unique properties is possible only by combining the efforts of scientific, educational and industrial organizations, as well as using tools that contribute to solving fundamental problems facing both the scientific community of Russia and the whole world. It is known that in most cases of using materials in extreme conditions, it is the surface that determines their functional properties and, as a result, the service life of products as a whole. A multiple reduction in the time of development and implementation of new materials, methods and equipment for their production on the territory of the Russian Federation is possible with the use of the most modern methods and techniques of synchrotron research.

A consortium consisting of such organizations as HCEI SB RAS, INP SB RAS, ISPMS SB RAS, TSC SB RAS, Tomsk universities - TPU, TSU, TUSUR, IEP UD RAS, as well as the Ufa State Aviation Technical University and the industry enterprise "Technopark-AT", since October 2021, have been implementing a project on the topic "In situ methods of synchrotron investigations of multilayer functional structures with unique parameters and properties created by beam-plasma surface engineering" within the framework of the Federal Scientific and Technical program for the development of synchrotron and neutron research and research infrastructure for 2019 - 2027".

The objectives of the project are related to each other and, in accordance with Direction 1 "Synchrotron and neutron research (development) in the field of materials science for the development of high-tech production technologies", are focused on creating infrastructure and developing methods for synchrotron and neutron research of structural and functional materials.

The report provides information on the progress of the project, including the most important scientific results obtained using synchrotron radiation, a description of the infrastructure facilities being created for synchrotron research, as well as the progress of the educational component of the project.

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<sup>1</sup>The work was carried out with the financial support of the Russian Federation represented by the Ministry of Science and Higher Education (project № 075-15-2021-1348) within the framework of the events № 1.2.1, 1.2.2 and 1.2.5.