

**Report of the Reviewer on the proposal for the opening of the new theme
“Investigations of Functional Materials and Nanosystems by Neutron Scattering
Methods”**

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In the period of 2018-2020, at FLNP the scientific theme 04-4-1121-2015/2020 “Investigations of Condensed Matter by Modern Neutron Scattering Methods” was well implemented. During these years, many interesting scientific results related to structural, magnetic and dynamical properties of various condensed matter systems were obtained. These results were published in more than 350 articles, and some of them – in leading scientific journals, like Nature Communications, Physical Review B, Physical Review Materials, Langmiur, etc., and presented in about 340 conference presentations. The high research quality is supported by JINR prizes attributed to selected research cases. The substantial upgrade of the IBR-2 spectrometer complex, including construction of new instruments should be also noted.

In the framework of the new theme, the research plan will be focused on the actual problems of the condensed matter physics, materials science, chemistry, biophysical and geophysical sciences, applied topics including neutron imaging and residual stress determination in different materials and products. The scientific research is concentrated on studies of crystal and magnetic structure, dynamics and properties of various functional materials, nanosystems, biological systems, polymers, constructional materials, rocks and minerals and expected results will be of significant importance for the research directions in consideration. The IBR-2 high flux pulsed reactor spectrometer complex will be naturally used as the experimental base. The scientific research will be performed in cooperation with other JINR Laboratories, LIT, BLTP, LRB, FLNR, VBLHE and numerous organizations from JINR Member States and other counties. The important addition to the planned scientific activities is the User Programme, which has been realized successfully during the last years.

A particular attention within the new theme will be given to further upgrade of the IBR-2 spectrometer complex. A creation of new instruments, modernization of existing instruments and development of prospective neutron scattering techniques are planned. The timescale planning of the proposed activities is reliable. All these activities will ensure the ongoing development of the IBR-2 spectrometer complex to keep it at the competing positions to other world leading neutron centers. The requested financial resources are reasonable with respect to planned activities.

The proposed theme will be realized basically in the Department of Neutron Scattering Investigations of Condensed Matter of FLNP. The staff of the Department is well recognized in research community and it is very active in the field. Their deep experience is supported by large number of publications in distinguished scientific journals and conference reports, awards and prizes of different level. Large number of young scientists and specialists from JINR Member States ensures positive dynamics in future Department development.

Concluding, I endorse the opening of the new theme “Investigations of Functional Materials and Nanosystems by Neutron Scattering Methods” and recommend its realization at JINR for the period of five years with the first priority.

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