Existing Developments and Directions for Further Development of Thermal-Neutron Detectors at the IBR-2 Department of Spectrometers Complex

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The Joint Institute for Nuclear Research (JINR) is one of the most important scientific centers in Russia and the world thanks to the existing experimental facilities distributed throughout the laboratories of the JINR.

For the Frank Laboratory of Neutron Physics (FLNP), the IBR-2 reactor is the main research facility. The rated power of the reactor is 2 MW, and the pulse half-width is 320 μs. The density of the thermal neutron flux from the surface of the thermal moderator is 10^{13} n/(cm^2 s).

The IBR-2 reactor has 14 research channels for extracting neutron beams, designed to conduct studies of condensed matter and biological systems by neutron scattering methods. Neutron beams are formed in the extraction channels, which are directed to specialized facilities, each of which is equipped with a neutron radiation detection system adapted to the measurement technique used at the facility.

The Department of Spectrometers Complex (DSC) of IBR-2 plays an important role in maintaining the efficiency and development of the experimental facilities. One of the most important activities of DSC is the development and creation of detector technologies, on the basis of which detectors for experimental installations are created.

This report will present the existing developments of Sector No. 1 of the DSC IBR-2 in the field of detectors for neutron detection and electronics for data collection and accumulation, as well as possible directions for future development.