

Project review
"Novel Semiconductor Detectors for Fundamental and Applied Research"
(*Project Leader: G.A. Shelkov, DLNP-JINR*)

X-ray radiation is widely used nowadays for research, medicine and engineering applications. Recent developments in X-ray sources should be complemented by an adequate selection of detectors. In particular, two-dimensional semiconductor detectors suitable for detecting X-ray and gamma radiation are of considerable interest and are a rapidly developing field of research.

This project is aimed at studying properties of new radiation-resistant semiconductor materials for their use in radiation detection devices and at developing new versions of semiconductor detectors and devices. It is a continuation of the previous project, successfully implemented in 2015-2020, which led to several interesting scientific results, the development of research infrastructure and the establishment of strong international cooperation in the framework of the collaboration Medipix. Thus, the project team has a strong background and significant experience, which will reduce the risks related to the implementation of this project.

The project has a well-developed timeline and will cover the entire spectrum of research activities, starting with the study of new radiation-resistant semiconductor materials, the development of detectors based on these materials (in particular, a prototype of the compact radiation-hardened electromagnetic calorimeter within the framework of the collaboration FCAL) and, finally, the development of a complete medical tomograph prototype with a high spatial resolution of several microns. The development of the detector based on the latest Medipix4 technology will have a positive effect on the parameters of the prototype, as well as further enhance the exchange of information and technologies between participants of the international collaboration Medipix. The development of a computer tomograph prototype, using hybrid pixel detectors as Medipix-based detectors, and related software is undoubtedly the most important expected result.

I believe that the implementation of this project will lead to significant scientific and practical results. The project plan and timescale are feasible, financial costs are justified, and the necessary resources are available. Therefore, I fully support the extension of the project for the period 2021-2023.

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