KIPT

NATIONAL SCIENCE CENTER

KHARKOV INSTITUTE OF PHYSICS AND TECHNOLOGY

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LAB: RESEARCH & DEVELOPMENT OF SEMICONDUCTOR AND GAS-FILLED DETECTORS OF IONIZING RADIATION

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Few words about

Department is a part of the largest research center in Ukraine.
Research area — radiation dosimeters and spectrometers for nuclear power, ecology, medical, and scientific applications
R&D area— semiconductor and gas-filled detectors of ionizing radiation

Skills and Expertise*

R&D of high-performance CdTe and CdZnTe gamma radiation detectors

R&D of beta and gamma radiation detectors based on ultrapure xenon gas

R&D of Compton detectors of thermal neutrons made of hafnium metal for NPP reactors

Skill scale

*The skill scale is from Fundamental Awareness (min) to Expert (max)

HISTORY, INTERESTS AND WHAT WE CAN OFFER

For over 25 years, we have accumulated vast scientific and technical experience in the development of ionizing radiation detectors, radiation technologies, the creation of devices and methods for working with various types of radiation and nuclear materials, working with highly pure substances, as well as in related specialties - materials science of metals and semiconductors, vacuum, plasma, acceleration processes.

Based on semiconductors CdTe (CdZnTe), a line of γ-quanta detectors has been created, which have a high detection efficiency, high spectral energy resolution, room-temperature operation, and small dimensions.
Gas-filled γ-radiation detectors with an extended service life and a wide radiation interval of operation, intended for use in extreme conditions, have been developed.
Thanks to the creation of the technology of hot plastic deformation of hafnium, a detector has been developed for in-reactor monitoring of the thermal neutron flux.

KEY PERSONS

Dr. Volodymyr Kutny — head of laboratory, expert in developing and manufacturing semiconductor detectors and detector devices. Expert in metallurgy and plastic deformation of color metals.
Dr. Oleksandr Rybka — research of electrophysical characteristics and development of semiconductor and gas-filled detectors for measuring ionizing radiation. Expert in semiconductor crystal growth and processing
Dr. Oleksiy Pudov — research of electrophysical characteristics and development of semiconductor and gas-filled detectors of ionizing radiation. Expert in thin-film solar cells

LAB FACILITIES

Equipment for production and research of CdZnTe radiation detectors, Xe-filled detectors. Wide range of radiation sources and accelerators for testing

- Technological equipment for processing of wire conductors and metals, for cutting crystals, for hot deformation of materials, for vac.depositing metals;
- Measurement equipment for measurements of: detectors' electrical and radiation parameters, counting and spectrometric characteristics.
- An installation for filling gas-filled detectors with highly pure gases.

PUBLICATIONS

- Investigation of the radiation characteristics of CdTe and CdZnTe g-radiation detectors (40 DOI articles)
- Development of CdTe and CdZnTe g-radiation detectors for use in nuclear power (20 DOI articles)
- Study of the transport properties of charge carriers in gas-filled detectors based on ultrapure xenon. (5 DOI articles)

INTERNATIONAL PROJECTS

- STCU partner project #P406 «Improvement of the quality of (Cd,Zn)Te single crystals for room temperature gamma ray detection»
- STCU project #6184 «Gamma Radiation Detector Based on High-Pressure Xenon»
- NATO SPS project G5373 «Upgrade and improvements of the hand-held gamma detector based on HPXe gas»

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