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## The radiation damage of PIN diode detectors irradiated with heavy ions studied with the positron annihilation spectroscopy

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The damage of semiconductor detectors caused by the ionizing radiation is a widely known phenomenon. In particular, the radiation resistance of PIN diodes used in various measuring systems have been the subject of research in the past. The response of such detectors to the high flux of gamma quanta [1], neutrons [2], protons and electrons [3] was studied.

The deterioration of the quality of the energy spectrum of the registered particles determines the scope of the detector's applicability. This is especially important when designing detection systems that are to operate with large streams of charged particles.

In the HIL in Warsaw [4] and at the JINR in Dubna the attempt has been made to document the radiation damage process of the  $300 \ \mu m$  PIN diode type detectors.

The spectroscopic properties of the irradiated PIN diode detector were monitored by measuring the spectrum collected off-beam with the 241Am  $\alpha$  source. Structural defects caused by the heavy ions in the irradiated PIN diodes were tested using the positron annihilation spectroscopy. This is a sensitive tool for the investigation of the open-volume defects as vacancies and their clusters [5,6,7].

The results of measurements will be presented.

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