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ABSTRACTS

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DETECTION OF HIGH ENERGY ELECTRONS BY CHERENKOV RADIATION IN DIAMOND

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Cherenkov detectors for detection of high energy particles are widely used. To obtain the necessary information about the characteristics of the particles (energy, type, etc.) can by analyze of the Cherenkov radiation (CR). Cherenkov detectors in various fields of science and technology are used. However, there are Cherenkov detectors applications, for example, in thermonuclear reactors and spacecraft, where special requirements are imposed on the radiator material. One of the promising radiator materials with high temperature and radiation resistance is diamond. In addition, the diamond has a low energy threshold for CR due to its high refractive index (2.42).

The spectral characteristics of the radiation of different specimens of type 2a synthetic diamonds under irradiation of electron beams with energies of tens to hundreds of keV was investigated. Based on the obtained data, the most suitable diamond specimens for use as a Cherenkov detector radiator were selected. CR was detected in a diamond. However, the radiation spectra also contain cathodoluminescence, which must be taken into account when creating Cherenkov detectors based on diamond.

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