

FRAGMENTATION OF NUCLEI UNDER RADIATION ACTION OF VARIOUS TYPE

Thursday, 14 July 2022 17:29 (20 minutes)

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The study of the mechanisms of formation and decay of an excited nucleus is important for describing the characteristics of fragments of a nuclear reaction [1]. The applied significance of this problem lies in the use of various types of radiation in experiments to determine the radiation effects in the electronics. The single event effects on onboard electronics can occur not only from direct medium ionization by primary ions, but also from the effect of charged fragments of the nuclear reactions on the sensitive volumes of electronic circuit assemblies [2].

We study the influence of the primary particle of ionizing radiation on the mechanism of relaxation of the excited nucleus, as well as on the distribution of heavy secondary ions with the nuclear charge $Z > 2$ during the passage of protons, gamma rays and relativistic electrons through silicon. The interaction cross section and secondary ion energy distribution at the moment of decay of an excited nucleus were calculated using the GEANT4 [3] and TALYS [4] programs. A new analytical approximation for secondary heavy ion distribution in terms of linear energy transfer is proposed.

1. N.V. Novikov, N.G. Chechenin, N.V. Chuvilskaya et al. Physics of Atomic Nuclei. 84, 315 (2021).
2. N.V. Novikov, N.G. Chechenin, and A.A. Shirokova J. Surface Investigation. № 2, 236 (2021).
3. J. Allison, K. Amako, J. Apostolakis et al. NIM A.835, 186 (2016).
4. A. J. Koning, and D. Rochman. Nucl. Data Sheets. 113, 2841 (2021).

The speaker is a student or young scientist

No

Section

1. Experimental and theoretical studies of nuclear reactions

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Session Classification: Experimental and theoretical studies of nuclear reactions