

Nuclear fragmentation in metallic layers of 3D-technology electronic

A possible contribution to the upsets of on-board electronics of secondary particles –nuclear fragments originated from nuclear reactions of high energy particles, protons and ions, with materials of integrated circuits will be discussed. Space radiation has a broad spectrum of energy, a big variety of particle species with their mass variation, coming from the Sun and from Galactic and Extra-Galactic regions. Depending on the energy and mass, the particles are localized at certain altitude with respect to the Earth. The variation of the solar activity reflects variation in the Galactic Cosmic rays. The more active the Sun, the less GSRs can reach the Earth. A 3D structure electronics with a multiple layers containing transistors can be further more vulnerable to the nuclear reactions induced SEUs. Striking proton can move through a series of the heavy elements columns above the sensitive volumes in the transistor layers. This can significantly enhance the SEU possibility due to nuclear reactions.

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