

反应堆工程

SRAM单元中子单粒子翻转效应的Geant4模拟

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收稿日期 修回日期 网络版发布日期:

摘要 应用Geant4工具, 构造了不同特征尺寸的SRAM单元几何模型及单粒子翻转截面计算模型, 分析了敏感体积和临界电荷对低能中子单粒子翻转效应的影响趋势, 计算了反应堆裂变中子谱辐射环境下, 不同特征尺寸SRAM的中子单粒子翻转截面, 认为小尺寸SRAM器件的低能中子单粒子翻转效应更为严重。

关键词 [中子](#) [单粒子翻转](#) [Geant4](#) [特征尺寸](#) [临界电荷](#)

分类号

Simulations of Single-Event Upset in SRAMs Induced by Neutrons With Geant4

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Abstract The sensitivity of SRAMs to single event upsets induced by neutrons with decreasing feature sizes was investigated using the Monte Carlo code Geant4. Their device architecture and single event upset cross section computation approach were presented. The single event upset cross sections were analyzed for mono energetic neutron and neutrons of fission spectrum of a reactor and discussed on the basis of different parameters such as the sensitive volume, the critical charge and the incident neutron energy. Small size SRAM devices are more sensitive than large size devices on single event upset effect induced by low energy neutron.

Key words [neutron](#) [single-event upset](#) [Geant4](#) [sensitive volume](#) [critical charge](#)

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