

Scaling of SEU mapping and cross section, and proton induced SEU at reduced supply voltage

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New experimental study of heavy ion and proton induced SEU at reduced voltage (i.e. reduced critical charge) reveals interesting results. It is shown that the heavy ion cross section and microprobe mapping scale like the threshold LET and the parameter which is almost invariant under bias changes, is the effective charge collection depth. For studying proton induced SEU and surface-barrier-detector spectra we use proton energies from 5.6 to 300 MeV. The results are analyzed in view of the processes involved in low energy deposition by protons. Detailed calculations show the importance of straggling in proton direct ionization which might be the leading process in very sensitive devices like photodiodes.