

Hardening ASICs against radiation effects

Application-Specific Integrated Circuits (ASICs) designed for application in LHC experiments have to operate reliably in a severe radiation environment. This lecture will introduce the main reasons for failure of CMOS circuits in such environment, and how the sensitivity to radiation effects has evolved with the constant decrease of lithographic dimensions in CMOS manufacturing processes. Design techniques to protect the ASICs designed in commercial-grade technologies against radiation effects will be presented along with examples where they have been successfully used in the development of ASICs for the first generation of LHC experiments.

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