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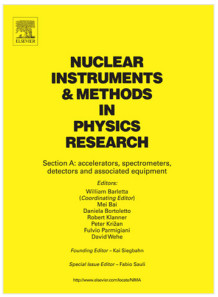

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Radiation Hardness Of Gallium Doped Low Gain Avalanche Detectors ⋆

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Abstract

Low Gain Avalanche Detectors (LGADs) are based on a n^{++}-p^{+}-p-p^{++} structure where appropriate doping of multiplication layer (p^{+}) leads to high enough electric fields for impact ionization. Operation of these detectors in harsh radiation environments leads to decrease of gain attributed to the effective acceptor removal in the multiplication layer. In order to cope with that devices were produced where boron was replaced by gallium. The initial radiation hardness studies show a smaller degradation of gain with neutron fluence indicating that gallium is more difficult to displace/deactivate from the lattice site than boron.

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Key words: Silicon detectors, Radiation damage, Charge multiplication, Acceptor removal

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