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Acceptor removal and gain Reduction in proton and neutron irradiated LGADs

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Using electrical characterization, acceptor removal coefficients are estimated and compared for Boron, Gallium and Boron with Carbon diffused gain layer LGADs. Effective implant is computed as a function of fluence for up to 6×10^{15} neutron and proton irradiated sensors in different processes. Results are compared to gain reduction calculations and recombination coefficients are derived. The two separate approaches are compared with laboratory charged collection measurements obtained, while a breakdown voltage model is also considered. A direction for further improvement on radiation hardness is presented for discussion.

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