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## Response of Low Gain Avalanche Detector Prototypes to Gamma Radiation

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Motivated by the need for fast timing detectors to withstand up to 2 MGy of ionizing dose at the High Luminosity Large Hadron Collider, prototype low gain avalanche detectors (LGADs) have been fabricated in single pad configuration, 2x2 arrays, and related PIN diodes, and exposed to Co-60 sources for study. Devices were fabricated with a range of dopant layer concentrations and, for the arrays, a variety of inter-pad distances and distances from the active area to the edge. Measurements of capacitance versus voltage and leakage current versus voltage have been made to compare pre- and post-irradiation characteristics in gain layer depletion voltage, full bulk depletion voltage, and breakdown voltage. Conclusions are drawn regarding the effects of the gammas both on surface and interface states and on their contribution to acceptor removal through non-ionizing energy loss from Compton electrons or photoelectrons. Comparison of the performances of members of the set of devices can be used to optimize gain layer parameters.

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