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Study of depth-dependent charge collection profiles in irradiated pad diodes

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In this work, charge collection profiles of non-irradiated and irradiated $150\ \mu\text{m}$ p -type pad diodes were measured using a 5.2 GeV electron beam traversing the diode parallel to the readout electrode. Four diodes were irradiated to 1 MeV neutron equivalent fluences of 2, 4, 8, and $12 \times 10^{16}\ \text{cm}^{-2}$ with 23 MeV protons. By unfolding the measured charge collection profiles, the Charge Collection Efficiency profiles are extracted as a function of depth. The results of the measurements are compared to the simulation using three radiation damage models from literature which were tuned to different irradiation types and fluences.

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