Characteristics of thin p-MCz Si microstrip detector Irradiated up to a mixed fluence of 1017 neq,/cm2 for the FCC

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**Abstract.** Silicon microstrip detectors can be used for the precise particle tracking in the inner tracking region of the detector used in the future high luminosity collider experiment. In the future experiments, hadron collider provides higher luminosities on the strip detector, and therefore, a detector requires very high radiation hardness. Within CERNRD50collaboration, MCz Si is identified as a prime radiation hard material for the fabrication of the p-Si microstrip detector. In this paper, we have used the experimentally verified four level deep-trap mixed irradiation model for p-MCz Si to investigate the effect of heavy irradiations up to a mixed fluence of 1017n eq./cm2 on the full depletion voltage, leakage current, and charge collection efficiency using SRH and CCE modelling.

The changes in the characteristics were evaluated, and effect of the traps on the macroscopic performance of the detectors and possible improvement in the design and semiconductor technology of the p-Mcz silicon microstrip detector

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1. [↑](#footnote-ref-2)