**Study of Proton Radiation Damage Effects in Si-Microstrip Detector for New and Fast Tracking System of pCT**

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**Abstract**. A new and fast radiation hard p- Si microstrip detectors requires for the high proton imaging performance using the Proton Computed Tomography (pCT) system. Silicon trackers of the pCT have been measured the actual proton dose delivered to the cancer patient during the medical treatment. In this paper, several proton cancer doses up to 4000 Gy are used for the SRH modelling of the full depletion volage, and leakage current at 293 K of the Si microstrip detector using micoscopic radiation damage model. Radiation hard thin (150$μm$) p- type MCz Si microstrip detector design is proposed for the pCT that can work up to 800V for very high-irradiated proton cancer doses.

References

* Alexandra Junkes, Jenni Honkanen, Jari Paloheimo, Janne Pekuri, “ Novel MCz-silicon material and application for the radiation detection community”, $12^{th}$Trento Workshop- Feb$22^{nd}$2017
* Paganetti, Harald. “Proton beam therapy”. Bristol: IOP Publishing, 2017. Doi:10.1088/978-0-7503-1370-4ch1
* M. Petasecca, F. Moscatelli, D. Passeri, and G. U. Pignatel, “Numerical Simulation of Radiation Damage Effects in p-Type and n-Type FZ Silicon Detectors”, IEEE, 2006
* R.Eber, “Development of radiation tolerant silicon sensors”, JINST,2014