



Title:

Characterization of a Silicon Carbide device used as a dosimeter in the SAMOTHRACE project

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Abstract

Silicon Carbide detectors recently received an increased interest in the scientific community in their use as a dosimeter [1, 2]. Compared to the traditional silicon detectors they showed good resistance, thermal stability, thermal conductivity, larger bandgap and higher breakdown electric field strength [3]. In the following poster the work on Silicon Carbide, in the framework of Samothrace ecosystem is presented [4]. Results on the characterization and simulation of a SiC detector of dimension 1cmx1cm and 10um thick, used as a dosimeter will be presented. Comparisons with other common semiconductor dosimeters, as silicon and diamond, will be included [5].

Bibliography

- [1] G. Bertuccio et. al., "Silicon carbide detectors for in vivo dosimetry," *IEEE Transactions on Nuclear Science*, pp. 61.2: 961-966., 2014.

- [2] G. Petringa et. al., "First characterization of a new Silicon Carbide detector for dosimetric applications," *Journal of Instrumentation*, p. 15.05: C05023., 2020.
- [3] S. Tudisco et. al., "SiCILIA—Silicon Carbide Detectors for Intense Luminosity Investigations and Applications," *Sensors*, 2018.
- [4] <https://samothrace.eu/>. [Online].
- [5] M. Marinelli et. al., "Dosimetric characterization of a synthetic single crystal diamond detector in a clinical 62MeV ocular therapy proton beam," *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, vol. 767, pp. 310-317, 2014.