Detailed feasibility study of a gamma ray detector system for nanosatellites using GEANT4 simulations

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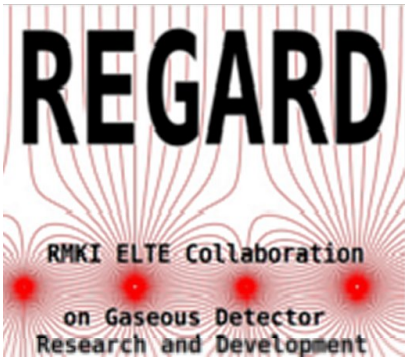

Témavezetők:
Conseil Européen pour la Recherche Nucléaire (CERN)

2016

Contents

Introduction

High energy astrophysics

Aim of the simulation

The main aim of the paper, therefore this thesis is to optimize the scintillators of the CubeSats (miniaturized satellites) in the Constellation Gamma satellites. The second aim is to understand how the material of the CubeSat would affect the gamma photons that the satellite is meant to detect.

The Constellation Gamma (ConGa) fleet

Simulation

In order to understand how the γ photons – that the CubeSat is meant to detect – interact with the matter of the satellite simulations are needed. In a simulation it is also possible to determine the optimal geometry that would lead to the best GRB detection.

The Geometry... XXX TRacking (Geant4)

Setup

Results of the simulation

Validation of the simulation

Optimalization of the scintillator detectors

Conclusion

Acknowledgment

References

[1] C. Shalem, R. Chechik, et al.,
Advances in Thick GEM-like gaseous electron multipliers—Part I: atmospheric pressure operation,
Nuclear Instruments and Methods in Physics Research A, vol. 558, page 475-489, 2006