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# Optimization of scintillators, applied to nuclear medicine and high energy physics

The project is focused on the optimization and characterization of inorganic scintillators. Scintillators are materials that emit light (flashes), when an energy particle deposits energy in its volume, it serves to collect light from the ionization process and has a wide range of applications that are find from the study of high-energy physics, astrophysics, nuclear physics, cosmic rays, geophysics and for basic instruments in nuclear medicine (Computed Tomography: CT , Positron Emission Tomography: PET, Single Positron Emission Tomography: SPECT).
Inorganic scintillators will be optimized and characterized by the simulation of several types (PWO4, ZnWO4, CaWO4, BGO and LSO) and geometries (cylinder and parallelepiped) of scintillators, this simulation will be analyzed in GEANT4 (GEometry ANd Tracking), a platform to simulate the passage of particles through matter and LITRANI (LIght TRansmission in ANIsotropic media), is a program to simulate the propagation of photons.
The studies carried out in scintillators are always considered polished surfaces, the improvement in this project is to use roughness surfaces to improve the light collection in the detector and on the other hand the scintillators PWO4, ZnWO4, CaWO4, for high energy physics and for BGO and LSO nuclear medicine.

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