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Development of the Fast and Efficient Gamma Detector Using Cherenkov Light for Positron Emission Tomography

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Positron emission tomography (PET) is a nuclear imaging technique widely used in oncology. Decay of the tracer emits positrons, which annihilate in the nearby tissue. Two gamma quanta with the energy 511 keV are produced by positron annihilation and allow one to reconstruct the annihilation vertex and distribution of the tracer activity in the body of the patient. I developped an innovative detector using the Cherenkov photons produced by electrons from the photo-ionization conversions of 511 keV gamma, with a high efficiency and time resolution, in parallel with some simulations. I will present in my talk some basics about PET, then the detector which I built and my first results.

Auteur principal: Mlle CANOT, Clotilde (CEA IRFU)

Orateur: Mlle CANOT, Clotilde (CEA IRFU)

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