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study of prompt gamma emission in the fission mechanism

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Presented here is my work on the study of prompt gamma emission in the fission mechanism. From a nuclear reactor physics point of view, it addresses the gamma heating issue in nuclear reactor cores. On the other hand, gamma emission can help understand the fission process in terms of fundamental physics. Results from experiments in 2016 at ALTO (Linear Accelerator and Tandem Orsay) by using the LICORNE neutron source, to study prompt fission gamma rays of U-238 at neutron energies of 1.7 MeV and 4.5 MeV. LICORNE can generate natural focusing of fast neutrons by inverse kinematics reaction: $p(7\text{Li}, n)^7\text{Be}$ and $p(11\text{B}, n)^{11}\text{C}$. This feature allows the placement of detectors close to the target with low neutron background from the source. In this experiment, several types of scintillator were used to detect gamma rays, including LaBr₃, BaF₂ and a new type of phoswich named PARIS. The measured spectra will be deconvoluted by using response matrices simulated in GEANT4.

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