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Study of the nuclear fission process by prompt gamma-ray spectrometry

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My PhD is done in cooperation between the SPHN at CEA Saclay and the SPRC at Cadarache. It consists in the study of the fission process and the deexcitation of the fission fragments. The first step is the analysis of an experimental campaign performed in 2012 at ILL in Grenoble (EXILL), in which a U-235 and a Pu-241 target were irradiated by a beam of cold neutrons. A unique feature of the experiment was the use of a large array of germanium detectors to measure gamma-rays coming from the deexcitation of fission fragments. The main aim is to obtain accurate values for gamma-ray transition intensities and nuclear energy level feeding during the deexcitation cascade, as well as the yields of the fission fragments pairs. These results will be afterwards compared with the fifrelin code developed at Cadarache and will be used to improve the relevant physical processes included in fifrelin (e.g. spin distribution at fission, energy sharing, neutron evaporation, gamma-ray cascade).

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