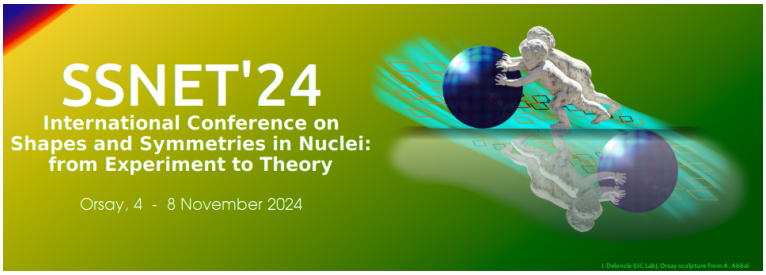

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Probing nuclear structure with thermal neutrons

lundi 4 novembre 2024 12:50 (20 minutes)

Among the different approaches to study the structure of nuclei, thermal neutron induced reactions can be used to probe different phenomena. Capture reactions on (rare) stable or radioactive targets populate low-spin states below the neutron separation energy. With thermal neutron induced fission on actinides, neutron-rich nuclei are populated at moderately high spin. Those reactions are used at the Institut Laue-Langevin (ILL, Grenoble), at a high-resolution gamma-ray spectroscopy setup. FIPPS (Fission Product Prompt gamma-ray Spectrometer) has been used to study the structure of nuclei in different region of the nuclear chart, addressing phenomena as shape coexistence in different region of the nuclear chart.
After a general introduction about the nuclear physics activities at the Institut Laue-Langevin, recent results obtained in different experiments at FIPPS will be reported. Particular focus will be dedicated to the first fission campaigns, showing the innovative technique of fission tagging and first results. The novel use of this device for the measurement of lifetimes of medium-high spin states in neutron-rich nuclei will be shown. Preliminary results on the structure of neutron-rich Br isotopes will be highlighted, as well as the ones already published about the structure of nuclei produced after neutron-induced reactions on beta radioactive targets. The future perspectives for the coupling of the existing FIPPS setup to a fission-fragment identification system will also be outlined.

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