



Centre d'Études Nucléaires de Bordeaux-Gradignan

Application for a PhD position at the Centre d'Études Nucléaires de Bordeaux-Gradignan.

The ACEN (Aval du Cycle et Energie Nucléaire) group is involved in nuclear data measurements for nuclear waste transmutation (Minor Actinide incineration) and innovative systems aiming at producing less waste (Thorium cycle). The group has good visibility and renowned status on national and international level. The research program is supported by CNRS/IN2P3 and the GEDEPEON/PACE consortium which coordinates, at the French level, the whole research program on nuclear waste management (transmutation and geological disposal) and advanced innovative nuclear systems (ADS, Molten salt reactors and GEN IV reactors). The ACEN group has an acknowledged expertise in nuclear fission, neutron induced reaction mechanism, neutron and γ detection techniques.

We are looking to fill a PhD position to work on capture-to-fission cross section ratio of ^{233}U in the energy range from resonance to fast neutrons (0.1 eV to 2 MeV)

Scope of the thesis

The Th-U fuel cycle presents two important advantages with respect to the current fuel cycle: a minimized proportion of heavy, long-lived radiotoxic nuclei in the spent fuel and the capability of breeding either in a thermal or a fast neutron spectrum. Recent sensitivity studies of the impact of the cross section uncertainties on the breeding capability of this fuel cycle have shown that fissile regeneration is dominated by the uncertainty in the ratio between the capture and the fission cross sections of ^{233}U . Indeed, the available data for this ratio present a dispersion of 25% which is much larger than the predicted breeding ratio (0.1-0.15) of reactors utilizing the thorium- ^{233}U cycle . It is proposed to measure carefully the capture-to-fission cross sections ratio of ^{233}U in the resonance and fast neutron energy domain using the GELINA (JRC-Geel) and the AIFIRA (CENBG) facilities.

The fellowship is intended for a 3 years contract. The applicant should have a Master II degree or equivalent. Graduate students with a Master in Research are also welcome to apply. The deadline for application is 24 June 2009.

Requests for further information can be obtained from barreau@cenbg.in2p3.fr or aiche@cenbg.in2p3.fr.