

CENTRE D'ÉTUDES NUCLEAIRES DE BORDEAUX-GRADIGNAN

Jeudi 19 Décembre 2013

à

11H00

Un café sera servi à partir de 10h45

Daniel BAZIN

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Nuclear physics at high luminosity

In this talk I will address issues related to performing experiments using rare isotope beams with very low intensities such as those presently or projected to be available at facilities around the globe. Techniques and methods to utilize these sparse beams in the most optimum way are essential to the progress of nuclear science. I will present two approaches that are well adapted to two different energy domains: knockout reactions on fast beams produced via projectile fragmentation on the high energy side, and using an active target detector to maximize the luminosity of experiments on the low energy side.

Although knockout reactions have been used extensively for over a decade, the details of the underlying reaction mechanism has only recently been explored experimentally. I will show results of exclusive experiments that demonstrate the robustness of our understanding of such reactions, and validate their use as a spectroscopic tool. These reactions were used to measure one-nucleon removal cross section with a 5% precision on radioactive p-shell nuclei and interpret the results in relation to ab-initio calculations of spectroscopic factors.

On the opposite side of the energy domain where nuclear reactions can be used to probe the nucleus, low energy reactions in inverse kinematics are plagued by the difficulty to efficiently and precisely measure the characteristics of the emerging particles. The Active Target Time Projection Chamber (AT-TPC) under construction at the NSCL offers an elegant solution to this dilemma, and promises to advance our reach towards very exotic nuclei produced as weak radioactive beams.

Salle des Séminaires du CENBG

Le haut Vigneau - BP 120 -F-33175 Gradignan Cedex