

Service de Physique Nucléaire



Séminaire

le lundi 2 Avril 2012 à 11h

Jour inhabituel

CEA Saclay, Orme des Merisiers, Bât. 703, Salle 135

SCRIT Electron Scattering facility Hofstadter's experiments for exotic nuclei

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Electron scattering is known to be the best probe for structure studies of atomic nuclei. It has been, thus, consistently playing a key role for our understanding of the internal structure of stable nuclei.

For exotic nuclei, however, it has never been applied simply due to difficulties of target preparation, since they are rarely produced and short lived. In order to overcome the difficulties, we have proposed a novel internal-target scheme, SCRIT (Self-Confining RI Target).

Feasibility studies using a prototype with stable Cs ions demonstrated that this scheme works, and a luminosity of higher than 10^{26} /cm²/s is achievable with only 10^6 trapped ions with the trapping time of 50 ms. Note that the luminosity of an order of 10^{26-27} /cm²/s is required to perform the Hofstadter's experiments for exotic nuclei, where one determines their charge form factor.

Based on the success of the feasibility studies, we are now constructing a world's first electron-scattering facility for short-lived nuclei in RIKEN RI Beam Factory. The facility consists of an electron accelerator, an ISOL system and an electron detection system. The electron accelerator consists of a 150-MeV injector microtron and a 700-MeV storage ring with the SCRIT device. The accelerator has been already installed and successfully commissioned. In parallel with construction of an electron spectrometer and an ISOL system, a series of R&D studies using stable isotopes is now underway for achieving higher luminosities.

In my talk, I will discuss on physics motivation of electron scattering for short-lived nuclei, the brand-new experimental technique and the new electron scattering facility under construction. The first collision of electrons and short-lived nuclei will take place in 2014.

In addition, I will touch upon future perspectives of structure studies of exotic nuclei by electron scattering with higher luminosities.

Le café sera servi 10 minutes avant

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