

Titre de la thèse : « système de production d'éléments exotiques déficitaires en neutrons »

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Abstrat :

The GANIL/SPIRAL1 facility produces Radioactive Ion Beams (RIB) using the ISOL method. This thesis work focuses on the improvement and development of several Target and Ion Source System (TISS), with the aim of increasing the available RIB variety and intensity. The first part of this memoir present the improvement made on the FEBIAD TISS that had poor ionization efficiency and reliability issues. Using a series of experimental tests, the source of the problem has been identified and fixed, leading to an Ar⁺ ionization efficiency of 20% and over 60 new RIB available at SPIRAL1. The second and main part of this work take place in the frame of the TULIP project. This first milestone of this project is to produce neutron deficient Rb⁺ RIB using a surface ionization ion source, completed and presented in this thesis. The final goal is the production of neutron deficient RIB in the region of ¹⁰⁰Sn, which require adapting the ionization process to electron impact ionization. Consequently, a new ion source has been developed. Simulation and analytical modelization were used to design the source. Finally, a room temperature prototype was designed, build, and tested. This prototype was used to measure ionization efficiency and time response of the TISS. The result were used to extrapolate the ionization efficiency to the high temperature TISS, with 5% efficiency for tin.

Date et lieu de la soutenance : 13/06/2024 à 10h00 - Salle ILTIS, LPC Caen, 6 Blvd Maréchal Juin, 14050 Caen CEDEX 4