Contribution ID : **45** Type : **oral contribution**

β-decay study of 76,77Cu

Monday, 27 May 2024 16:00 (20)

Nuclei in the vicinity of doubly-magic nuclei, such as ^{78}Ni, are of considerable interest for studying the evolution of shell structure within the nuclear shell model. Understanding this evolution is essential for accurately describing exotic nuclear phenomena. In particular, the shape coexistence in ^{79}Zn makes this region especially intriguing, given that such a phenomenon is uncommon in the vicinity of doubly-magic nuclei. Additionally, ^{78}Ni and its neighboring nuclei exhibit high neutron-to-proton ratios, making them particularly significant in the field of astrophysics due to their role in the rapid neutron-capture process (r-process). Exploring these neutron-rich nuclei provides crucial insights into the mechanism underlying the r-process.

The nuclear structure of ^{77}Zn has been studied through the β decay of ^{77}Cu at ISOLDE. Copper isotopes were produced via neutron-induced fission on a UC$_x$ target. ^{77}Cu ions were laser ionized, accelerated, mass-separated and implanted into an aluminized mylar tape on the ISOLDE Decay Station (IDS), where the experimental setup was installed. We report on the decay scheme with newly discovered transitions and levels, the branching ratio of the βn process and, for the first time, the half-lives of two excited states in ^{77}Zn.

We also investigated the controversial existence of the ^{76}Cu isomeric state. According to our data, the scenario remains unclear.

Primary author(s) : PALACIOS SUÁREZ-BUSTAMANTE, David (IGFAE)

Co-author(s) : Dr. OLAIZOLA, Bruno (IEM-CSIC); ILLANA SISON, Andres (UCM); Dr. AYYAD, Yassid (IGFAE); ARASZKIEWICZ, Martyna (University of Warsaw); BENITO, Jaime (University of Padova); FAVIER, Zoé (CERN); Prof. FRAILE, Luis Mario (Universidad Complutense de Madrid); GEORGIEV, Georgi (IJCLab); KORGUL, Agnieszka (University of Warsaw); KÖSTER, Ulli (ILL); MARTÍNEZ, Víctor (Universidad Complutense de Madrid); MIHAI, Radu Emanuel (IFIN-HH); MONTES PLAZA, Adrián (University of Jyväskylä); PAGE, Chris (CERN / University of York); PODOLYÁK, Zsolt (University of Surrey); POKLEPA, Wiktor (University of Warsaw); RAZVAN, Lica (IFIN-HH); RODRÍGUEZ, Javier (Universidad Complutense de Madrid); STRYJCZYK, Marek (University of Jyväskylä); YUE, Zixuan (CERN / University of York)

Presenter(s) : PALACIOS SUÁREZ-BUSTAMANTE, David (IGFAE)

Session Classification : Session 3