



Contribution ID: 161

Type: Oral

Investigation of the orbital electron-capture decay of hydrogen-like $^{142}\text{Pm}^{60+}$ ions at the Experimental Storage Ring (ESR)

Thursday, 3 September 2015 15:15 (15 minutes)

Two-body orbital electron-capture (EC) decay of stored and cooled highly charged ions has been studied in the Experimental Storage Ring (ESR) at GSI Helmholtzzentrum in Darmstadt, Germany. The H-like $^{142}\text{Pm}^{60+}$ ions were produced by fragmentation of 600 AMeV ^{152}Sm ions in a Be-target. The $^{142}\text{Pm}^{60+}$ fragments were separated in-flight by the Fragment Separator (FRS), injected into the ESR storage ring at 400 MeV/u and cooled to high phase-space density by stochastic and electron cooling. More than 10 000 EC decays have been recorded in a recent experiment at October 2014 by means of a 245 MHz resonator serving as a Schottky detector. This device revealed the true EC-decay time of single stored ions within 32 ms as identified by a tiny change of their revolution frequency. Moreover, owing to the high sensitivity and performance of this resonator also the velocity and momentum of the recoiling daughter nucleus immediately after the decay could be determined. The data analysis of independent groups is still in progress. This study presents the results obtained from the recent experiment of orbital electron capture decay of $^{142}\text{Pm}^{60+}$ ions at the ESR.

Primary author: OZTURK, FATMA CAGLA (UNIVERSITY OF ISTANBUL)

Co-authors: OZAWA, Akira (University of Tsukuba, Ibaraki, Japan); Mr GUMBERIDZE, Alexander (GSI Helmholtzzentrum für Schwerionenforschung); NAJAFI, Ali M. (Technische Universität München); MEI, Bo (Institute of Modern Physics, Chinese Academy of Sciences and J.W.-Goethe Universität); KLEFFNER, C. (GSI Helmholtzzentrum für Schwerionenforschung); KOZHUHAROV, Ch. (GSI Helmholtzzentrum für Schwerionenforschung); TRAGESER, Ch. (GSI Helmholtzzentrum für Schwerionenforschung and Institut für Atom- und Molekülphysik, Justus-Liebig Universität); Dr WEIDONG, Chen (GSI Helmholtzzentrum für Schwerionenforschung); Mr XIANGCHENG, Chen (GSI Helmholtzzentrum für Schwerionenforschung and Institute of Modern Physics, Chinese Academy of Sciences); Mr KLAUSHOFER, Christoph (Stefan Meyer Institut für subatomare Physik, Vienna); Mrs LEDERER, Claudia (School of Physics & Astronomy, The University of Edinburgh); SUZAKI, F. (RIKEN Nishina Center, Wako, Saitama, Japan and JRA research associate at RIKEN); Prof. BOSCH, FRITZ (GSI Helmholtzzentrum für Schwerionenforschung); WEBER, G. (Helmholtz-Institut Jena); Mr BINGSHUI, Gao (GSI Helmholtzzentrum für Schwerionenforschung and Max-Planck-Institut für Kernphysik); BEYER, H. (GSI Helmholtzzentrum für Schwerionenforschung); YANG, J. C. (Institute of Modern Physics, Chinese Academy of Sciences, Lanzhou, China); PIOTROWSKI, Jeremi (GSI Helmholtzzentrum für Schwerionenforschung); ZHONG, Liu (Institute of Modern Physics, Chinese Academy of Sciences); WANG, M. (Institute of Modern Physics, Chinese Academy of Sciences, Lanzhou, China); Mr HERDRICH, Marc Oliver (Helmholtz-Institut Jena); HEIL, Michael (GSI Helmholtzzentrum für Schwerionenforschung); HIROSHI, Miura (Graduate School of Science & Engineering, Saitama Univ., Saitama); Dr WINCKLER, NICOLAS (GSI Helmholtzzentrum für Schwerionenforschung); DAISUKE, Nagae (University of Tsukuba, Japan); PETRIDIS, Nikos (GSI Helmholtzzentrum für Schwerionenforschung); Mr KOVALENKO, Oleksander (GSI Helmholtzzentrum für Schwerionenforschung and Ruprecht-Karls Universität Heidelberg); Mr FORSTNER, Oliver (GSI Helmholtzzentrum für Schwerionenforschung and Helmholtz-Institut Jena); CHEN, R. (Institute of Modern Physics, Chinese Academy of Sciences, Lanzhou, China); SANCHEZ, R. (GSI Helmholtzzentrum

für Schwerionenforschung); REIFARTH, Rene (J.W.-Goethe Universität); Mr GRISENTI, Robert (GSI Helmholtzzentrum für Schwerionenforschung and J.W.-Goethe Universität); GERNHAEUSER, Roman (Technische Universität München); OMIKA, S. (Graduate School of Science & Engineering, Saitama Univ., Japan); PURUSHOTHAMAN, S. (GSI Helmholtzzentrum für Schwerionenforschung); TROTSENKO, S. (GSI Helmholtzzentrum für Schwerionenforschung); Dr SANJARI, SHAHAB (GSI Helmholtzzentrum für Schwerionenforschung); Prof. HAGMANN, Siegfert (GSI Helmholtzzentrum für Schwerionenforschung and J.W.-Goethe Universität); HAIK, Simon (GSI Helmholtzzentrum für Schwerionenforschung); NISHIMURA, T. (Graduate School of Science & Engineering, Saitama Univ., Japan); SUZUKI, Takeshi (Graduate School of Science & Engineering, Saitama Univ., Japan); Mrs HEFTRICH, Tanja (J.W.-Goethe Universität); Mr KÜHL, Thomas (GSI Helmholtzzentrum für Schwerionenforschung); ENDERS, W. (GSI Helmholtzzentrum für Schwerionenforschung); TU, Xiaolin (GSI Helmholtzzentrum für Schwerionenforschung, Max-Planck-Institut für Kernphysik and Institute of Modern Physics, Chinese Academy of Sciences, Lanzhou, China); YAN, Xinliang (GSI Helmholtzzentrum für Schwerionenforschung, Max-Planck-Institut für Kernphysik and Institute of Modern Physics, Chinese Academy of Sciences, Lanzhou, China); Prof. OKTEM, YESIM (UNIVERSITY OF ISTANBUL); Dr LITVINOV, YURI A. (GSI Helmholtzzentrum für Schwerionenforschung); YUAN, Youjin (Institute of Modern Physics, Chinese Academy of Sciences, Lanzhou, China); ZHANG, Yuhu (Institute of Modern Physics, Chinese Academy of Sciences, Lanzhou, China)

Presenter: OZTURK, FATMA CAGLA (UNIVERSITY OF ISTANBUL)

Session Classification: Nuclear Physics Applications III, Accelerators and Instrumentation III