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Gamma and fast-timing spectroscopy of 132Sn from the beta-decay of In isotopes

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Nuclei with a large N/Z ratio in this region are of great interest to test nuclear models and provide information about single particle states. During the last two decades there has been a substantial effort directed to gathering information about the region around 132Sn[1-3], the most exotic doubly-magic nucleus presently at reach. 132Sn is itself a very interesting case [4]. The simplest excited levels correspond with particle-hole states where a particle is excited across the energy gap of the closed shell. The identification of the p-h multiplets, provides information on the nuclear two-body elements. This isotope has been studied in detail through the β-decay of 132In [5]. Nevertheless, a lot of the expected p-h multiplet states remained unidentified.
We have used fast-timing and γ spectroscopy to investigate 132Sn. The experiment was carried out at ISOLDE, where the excited states of 132Sn were populated in the β-decay of In isomers, produced in a UCx target unit equipped with a neutron converter. The In isomers were ionized using the ISOLDE RILIS, which for the first time allowed isomer-selective ionization of indium. The measurements took place at the new ISOLDE Decay Station, equipped with four clover-type Ge detectors, along with a fast-timing setup consisting of two LaBr3(Ce) detectors and a fast β detector.
In this work we report on the excited structure of 132Sn, populated in the β-decay of 132In, and also, owing to the RILIS isomer selectivity, separately from the β-n decay of the 133In 1/2- isomer and 9/2+ ground state. We present a preliminary new level-scheme, which have been enlarged with 13 new levels and more than 40 new γ-transitions. These results are completed with new lifetimes values of excited states.
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Primary authors: Mr BENITO, Jaime (Grupo de Física Nuclear, Universidad Complutense de Madrid); FRAILE, L. M. (Grupo de Física Nuclear and UPARCOS, Universidad Complutense de Madrid, CEI Moncloa, E-28040 Madrid, Spain); KORGUL, A. (Faculty of Physics, University of Warsaw, PL 02-093 Warsaw, Poland); PIERSA, Monika (University of Warsaw)

Co-authors: ÁLVAREZ-RODRÍGUEZ, R. (Escuela Tecnica Superior de Arquitectura, Universidad Politécnica de Madrid, E-28040 Madrid, Spain); BENZONI, G. (Istituto Nazionale di Fisica Nucleare, Sezione di Milano, I-20133 Milano, Italy); BERRY, T. (Department of Physics, University of Surrey, Guildford GU2 7XH, United Kingdom); BORGE, M. J. G. (Instituto de Estructura de la Materia, CSIC, E-28006 Madrid, Spain); CARMONA, M. (Grupo de Física Nuclear and UPARCOS, Universidad Complutense de Madrid, CEI Moncloa, E-28040 Madrid, Spain); CHRYSALIDIS, K. (CERN, CH-1211 Geneva 23, Switzerland); CORREIA, J. G. (CERN, CH-1211 Geneva 23, Switzerland); COSTACHE, C. ("Horia Hulubei"National Institute of Physics and Nuclear Engineering, RO-077125 Bucharest, Romania); Dr CUBISS, J. G. (Department of Physics, University of York, York, United Kingdom); DE WITTE, H. (KU Leuven, Instituut voor Kern- en Stralingsfysica, B-3001 Leuven, Belgium); DAY GOODACRE, T. (CERN, CH-1211 Geneva 23, Switzerland); FEDOROV, D. V. (Petersburg Nuclear Physics Institute, NRC Kurchatov Institute, 188300

Gatchina, Russia); FERNÁNDEZ-MARTÍNEZ, G. (Institut für Kernphysik, Technische Universität zu Darmstadt, 64289 Darmstadt, Germany); GALAVIZ, D. (Universidade de Lisboa, Lisboa, Portugal); Mr GALVE, Pablo (Universidad Complutense de Madrid); GRZYWACZ, R. (Department of Physics and Astronomy, University of Tennessee, Knoxville, Tennessee 37996, USA); HENRICH, C. (Institut für Kernphysik, Technische Universität zu Darmstadt, 64289 Darmstadt, Germany); HUYSE, M. (KU Leuven, Instituut voor Kern- en Stralingsfysica, B-3001 Leuven, Belgium); ILLANA SISON, Andres (LNL); Prof. JANAS, Zenon (Faculty of Physics, University of Warsaw); JOHNSTON, K. (CERN, CH-1211 Geneva 23, Switzerland); KARANYONCHEV, V. (Institut für Kernphysik, Universität zu Köln, D-50937 Köln, Germany); KICIŃSKA-HABIOR, M. (Faculty of Physics, University of Warsaw, PL 02-093 Warsaw, Poland); LICA, R. (CERN, CH-1211 Geneva 23, Switzerland); Mr LÓPEZ-MONTES, Alejandro (Grupo de Física Nuclear, Universidad Complutense de Madrid); MADURGA, M. (Department of Physics and Astronomy, University of Tennessee, Knoxville, Tennessee 37996, USA); MARROQUÍN, I. (Instituto de Estructura de la Materia, CSIC, E-28006 Madrid, Spain); MARSH, B. (CERN, CH-1211 Geneva 23, Switzerland); Mr MARTÍNEZ, Cristina (Universidad Complutense de Madrid); MAZZOCCHI, C. (Faculty of Physics, University of Warsaw, PL 02-093 Warsaw, Poland); MIERNIK, K. (Faculty of Physics, University of Warsaw, PL 02-093 Warsaw, Poland); MIHAI, C. ("Horia Hulubei"National Institute of Physics and Nuclear Engineering, RO-077125 Bucharest, Romania); OLAIZOLA, B. (Department of Physics, University of Guelph, Guelph, Ontario, Canada N1G 2W1); IBÁÑEZ, Paula (Grupo de Física Nuclear, Dpto. Física Atómica, Molecular y Nuclear, Universidad Complutense de Madrid, CEI Moncloa, Avda. Complutense s/n, 28040 Madrid, Spain); PAULASKALAS, S. (Department of Physics and Astronomy, University of Tennessee, Knoxville, Tennessee 37996, USA); Mr RAISON, Christopher (University of York); REGIS, Jean-Marc (University of Cologne); REZYNKINA, Kseniia (KU Leuven, Instituut voor Kern-en Stralingsfysica, Leuven, Belgium); ROTHE, S. (CERN, CH-1211 Geneva 23, Switzerland); SANCHEZ PARCERISA, Daniel (UCM); SÁNCHEZ-TEMBLEQUE, V. (Grupo de Física Nuclear and UPARCOS, Universidad Complutense de Madrid, CEI Moncloa, E-28040 Madrid, Spain); SCHOMACKER, Kerstin (Institut fuer Kernphysik, Universitaet zu Koeln, Germany); SIMPSON, G. (Laboratoire de Physique Subatomique et de Cosmologie, IN2P3-CNRS/Université Grenoble Alpes, Grenoble Cedex F-38026, France); SOTTY, Ch. ("Horia Hulubei" National Institute of Physics and Nuclear Engineering, RO-077125 Bucharest, Romania); STAN, L. ("Horia Hulubei" National Institute of Physics and Nuclear Engineering, RO-077125 Bucharest, Romania); STĂNOIU, M. ("Horia Hulubei"National Institute of Physics and Nuclear Engineering, RO-077125 Bucharest, Romania); STRYJCZYK, Marek (KU Leuven, Instituut voor Kern-en Stralingsfysica, Leuven, Belgium); TURTURICA, A. ("Horia Hulubei"National Institute of Physics and Nuclear Engineering, RO-077125 Bucharest, Romania); UDÍAS, J. M. (Grupo de Física Nuclear and UPARCOS, Universidad Complutense de Madrid, CEI Moncloa, E-28040 Madrid, Spain); VAN DUPPEN, P. (KU Leuven, Instituut voor Kern- en Stralingsfysica, B-3001 Leuven, Belgium); VEDIA, V. (Grupo de Física Nuclear and UPARCOS, Universidad Complutense de Madrid, CEI Moncloa, E-28040 Madrid, Spain); VILLA, A. (Grupo de Física Nuclear and UPARCOS, Universidad Complutense de Madrid, CEI Moncloa, E-28040 Madrid, Spain); WALTERS, W. B. (Department of Chemistry, University of Maryland, Maryland 20742, USA); WARR, Nigel (Institut für Kernphysik, Universität zu Köln, Cologne, Germany)

Presenter: Mr BENITO, Jaime (Grupo de Física Nuclear, Universidad Complutense de Madrid)

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