



Contribution ID: 203

Type: Oral

Half-life measurements of the excited states of ^{81}Ge

Monday, 31 August 2015 14:00 (15 minutes)

A study of the nuclear structure of ^{81}Ge has been performed in order to better understand shell evolution in neutron-rich nuclei near the doubly magic ^{78}Ni . The experiment was performed at the CERN ISOLDE facility in the framework of a systematic ultra-fast timing [1] investigation of neutron rich nuclei populated in the decay of Zn. The use of the ISOLDE RILIS and a cooled transfer line between the ion source and the target [2] made it possible to produce a pure beam of ^{81}Zn ions, which was delivered to our compact fast-timing station equipped with two LaBr₃(Ce) detectors, a plastic scintillator and two HPGe detectors. In this work, we present the ^{81}Ge results arising from the analysis of the γ - γ HPGe coincidences and the fast-timing analysis based on β - γ (t) and β - γ - γ (t) events involving the fast scintillators. The level scheme presents 10 new levels and 15 new γ transitions with respect to the recent studies [3]. The decay half-life of ^{81}Ga was determined by using the strongest γ -rays from the decay. Several half-lives of excited states up to 2 MeV in ^{81}Ge have been measured. Based on these measurements and the improved level scheme, the spin-parity assignments will be discussed and compared with shell-model calculations.

[1] H. Mach, R.L. Gill and M. Moszynski, Nucl. Instrum. Meth. A 280, 49 (1989).

[2] U. Köster et al., Nucl. Instrum. Meth. B 266, 4229 (2008).

[3] P. Hoff and B. Fogelberg, Nucl. Phys. A 36, 210 (1981).

Primary authors: Prof. MACH, Henryk (Grupo de Física Nuclear, Facultad de Ciencias Físicas, Universidad Complutense - CEI Moncloa, E-28040 Madrid, Spain; National Centre for Nuclear Research, BP1, ul. Hoża 69, 00-681, Warsaw, Poland); Prof. FRAILE, Luis Mario (Grupo de Física Nuclear, Facultad de Ciencias Físicas, Universidad Complutense - CEI Moncloa, E-28040 Madrid, Spain); PAZIY, Vadym (Grupo de Física Nuclear, Facultad de Ciencias Físicas, Universidad Complutense - CEI Moncloa, E-28040 Madrid, Spain)

Co-authors: Prof. APRAHAMIAN, Ani (University of Notre Dame); Dr BUCHER, Brian (Department of Physics, University of Notre Dame, Notre Dame, Indiana 46556, USA); Dr OLAIZOLA, Bruno (Grupo de Física Nuclear, Facultad de Ciencias Físicas, Universidad Complutense - CEI Moncloa, E-28040 Madrid, Spain; Department of Physics, University of Guelph, Guelph, ON N1G 2W1, Canada); Dr CHRIS, Chiara (Department of Chemistry and Biochemistry, University of Maryland, College Park, Maryland 20742, USA; Physics Division, Argonne National Laboratory, Argonne, Illinois 60439, USA); Dr BERNARDS, Christian (Institut für Kernphysik, Köln, Germany; Wright Nuclear Structure Laboratory, Yale University, New Haven, Connecticut 06520, USA); Dr GHITA, Dan ("Horia Hulubei" National Institute for Physics and Nuclear Engineering, Magurele, Romania); Dr SIMPSON, Gary (LPSC); Mrs GHEORGHE, Ioana ("Horia Hulubei" National Institute for Physics and Nuclear Engineering, Magurele, Romania); Prof. JOLIE, Jan (Institut für Kernphysik, Köln, Germany); Dr RÉGIS, Jean-Marc (Institut für Kernphysik, Köln, Germany); Dr BRIZ, José Antonio (Instituto de Estructura de la Materia, CSIC, 28006 Madrid, Spain; Subatech Lab., IN2P3-CNRS, École des Mines de Nantes and Univ. Nantes. 4 rue Alfred Kastler, La Chantrerie BP 20722, 44307 Nantes cedex 3, France); Prof. UDÍAS, José Manuel (Grupo de Física Nuclear, Facultad de Ciencias Físicas, Universidad Complutense - CEI Moncloa, E-28040 Madrid, Spain); Dr STROE, Lucian ("Horia Hulubei" National Institute for Physics and Nuclear Engineering, Magurele, Romania); Mr RUDIGIER, Matthias (Institut für Kernphysik, Köln, Germany); Dr MARGINEAN, Nicolae ("Horia Hulubei" National Institute for Physics and Nuclear Engineering, Magurele, Romania); Prof. HOFF, Per (Department of Chemistry, University of Oslo, Oslo, Norway); Dr MARGINEAN, Raluca ("Horia Hulubei" National Institute for Physics and Nuclear Engineering, Magurele,

Romania); Mr LICA, Razvan ("Horia Hulubei" National Institute for Physics and Nuclear Engineering, Magurele, Romania); Dr TIBERIU, Sava ("Horia Hulubei" National Institute for Physics and Nuclear Engineering, Magurele, Romania); Dr KOESTER, Ulli (Institut Laue Langevin, 71 avenue des Martyrs, 38042 Grenoble Cedex 9, France); Prof. KURCEWICZ, Wiktor (Institute of Experimental Physics, University of Warsaw, Warsaw, Poland); Prof. WALTERS, William (University of Maryland)

Presenter: PAZIY, Vadym (Grupo de Física Nuclear, Facultad de Ciencias Físicas, Universidad Complutense - CEI Moncloa, E-28040 Madrid, Spain)

Session Classification: Nuclear Structure, Spectroscopy, and Dynamics I