

## First Results from the g-RISING campaign: The g factor of the $19/2^+$ isomer in $^{127}\text{Sn}$

D. L. Balabanski<sup>1,2</sup>, L. Atanasova<sup>3</sup>, M. Hass<sup>4</sup>, D. Bazzacco<sup>5</sup>, F. Becker<sup>6</sup>, P. Bednarczyk<sup>6,7</sup>, G. Benzoni<sup>8</sup>, N. Blasi<sup>8</sup>, A. Blazhev<sup>9</sup>, A. Bracco<sup>8</sup>, L. Caceres<sup>6,10</sup>, F. Camera<sup>8</sup>, S. K. Chamoli<sup>4</sup>, F. Crespi<sup>8</sup>, P. Detistov<sup>3</sup>, P. Doornenbal<sup>6</sup>, C. Fahlander<sup>11</sup>, E. Farnea<sup>5</sup>, G. Georgiev<sup>12</sup>, J. Gerl<sup>6</sup>, K. Gladnishki<sup>1</sup>, M. Górska<sup>6</sup>, H. Grawe<sup>6</sup>, J. Grebosz<sup>6,7</sup>, R. Hoischen<sup>11</sup>, G. Ilie<sup>9</sup>, M. Ionescu-Bujor<sup>13</sup>, A. Iordachescu<sup>13</sup>, A. Jungclaus<sup>10</sup>, G. Lo Bianco<sup>1</sup>, M. Kmiecik<sup>7</sup>, I. Kojouharov<sup>6</sup>, N. Kurz<sup>6</sup>, S. Lakshmi<sup>4</sup>, R. Lozeva<sup>14</sup>, A. Maj<sup>7</sup>, D. Montanari<sup>8</sup>, G. Neyens<sup>14</sup>, M. Pfützner<sup>15</sup>, S. Pietri<sup>16</sup>, Zs. Podolyák<sup>16</sup>, W. Prokopowicz<sup>6,7</sup>, D. Rudolph<sup>11</sup>, G. Rusev<sup>17</sup>, T. R. Saito<sup>6</sup>, A. Saltarelli<sup>1</sup>, H. Schaffner<sup>6</sup>, R. Schwengner<sup>17</sup>, G. Simpson<sup>18</sup>, S. Tachenov<sup>6</sup>, J. J. Valente-Dubon<sup>19</sup>, N. Vermeulen<sup>14</sup>, J. Walker<sup>6,16</sup>, E. Werner-Malento<sup>6,15</sup>, O. Wieland<sup>8</sup>, H. J. Wollersheim<sup>6</sup>, and M. Hjorth-Jensen<sup>20</sup>

<sup>1</sup> Dipartimento di Fisica, Università di Camerino and INFN, Sezione di Perugia, 62032 Camerino, Italy

<sup>2</sup> Institute for Nuclear Research and Nuclear Energy, Bulgarian Academy of Sciences, BG-1784 Sofia, Bulgaria

<sup>3</sup> Faculty of Physics, St. Kliment Ohridski University of Sofia, BG-1164 Sofia, Bulgaria

<sup>4</sup> Department of Particle Physics, Weizmann Institute of Science, Rehovot 76100, Israel

<sup>5</sup> Dipartimento di Fisica, Università di Padova and INFN, Sezione di Padova, 35131 Padova, Italy

<sup>6</sup> GSI, Planckstrasse 1, D-64291, Darmstadt, Germany

<sup>7</sup> The Henryk Niewodniczanski Institute of Nuclear Physics, Polish Academy of Sciences, PL-31-342 Krakow, Poland

<sup>8</sup> Dipartimento di Fisica, Università di Milano and INFN, Sezione di Milano, 20133 Milano, Italy

<sup>9</sup> IKP, Universität zu Köln, D-50937, Köln, Germany

<sup>10</sup> Departamento de Física Teórica, Universidad Autónoma de Madrid, E-28049 Madrid, Spain

<sup>11</sup> Department of Physics, Lund University, S-22100 Lund, Sweden

<sup>12</sup> Centre de Spectrométrie Nucleaire et de Spectrométrie de Masse, F-91405 Orsay Campus, France

<sup>13</sup> National Institute for Physics and Nuclear Engineering, P.O. Box MG-6, Bucharest, Romania

<sup>14</sup> Instituut voor Kern- en Stralingsfysica, K.U.Leuven, Celestijnenlaan 200D, 3001 Leuven, Belgium

<sup>15</sup> Institute of Experimental Physics, Warsaw University, PL-00-681 Warsaw, Poland

<sup>16</sup> Department of Physics, University of Surrey, Guildford, GU2 7XH, UK

<sup>17</sup> Institut für Kern- und Hadronenphysik, Forschungszentrum Rossendorf, D-01314, Dresden, Germany

<sup>18</sup> LPSC, 38026 Grenoble Cedex, France

<sup>19</sup> INFN - Laboratori Nazionali di Legnaro, 35020 Legnaro (Padova), Italy

<sup>20</sup> Department of Physics, University of Oslo, N-0316 Oslo, Norway

First results will be reported from g-factors studies of isomers in exotic nuclei, which were carried out within the g-RISING (Rare Isotope Investigations at GSI) project. The isomeric g factors were measured using the Time-Differential Perturbed Angular Distribution (TDPAD) method. GSI is the only facility where intense beams of fully stripped heavy ions ( $A \geq 80$ ) ions can be separated, which allows the preservation of the orientation of the nuclear spin ensemble as obtained in the fragmentation reaction. Isomers in the  $A \approx 130$  nuclei were populated in relativistic projectile fragmentation of a  $^{136}\text{Xe}$  beam at 600 MeV/u provided by the SIS synchrotron at GSI. It was impinging on a  $1 \text{ g/cm}^2$  Beryllium production target located at the entrance of the fragment separator (FRS). The final reaction products were stopped in a Copper plate in the final focal point of the FRS, which was mounted between the poles of an electromagnet, and provided a perturbation-free environment for the implanted isomers. The nuclei of interest were identified on an event-by-event basis and ion- $\gamma$  coincidences were recorded in the experiment. The isomeric  $\gamma$  decay was detected with eight Cluster Ge detectors (four of them with BGO shields) mounted in a ring in the horizontal plane, providing a singles  $\gamma$ -ray efficiency  $\varepsilon \approx 3\%$  at 1.3 MeV. An overview of the experimental technique will be given, together with of the performance of the array. The presentation will focus on the results for the  $19/2^+$   $4.5 \mu\text{s}$  isomer in  $^{127}\text{Sn}$ , which will be compared to large scale shell-model (LSSM) calculations.