

XXI International School on Nuclear Physics and Applications and International Symposium on Exotic Nuclei (ISEN 2015)

Journal of Physics: Conference Series Volume 724

Varna, Bulgaria
6 – 12 September 2015

ISBN: 978-1-5108-2675-5
ISSN: 1742-6588

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2015) by the Institute of Physics
All rights reserved. The material featured in this book is subject to
IOP copyright protection, unless otherwise indicated.

Printed by Curran Associates, Inc. (2016)

For permission requests, please contact the Institute of Physics
at the address below.

Institute of Physics
Dirac House, Temple Back
Bristol BS1 6BE UK

Phone: 44 1 17 929 7481
Fax: 44 1 17 920 0979

techtracking@iop.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

NUMEN PROJECT @ LNS : HEAVY IONS DOUBLE CHARGE EXCHANGE AS A TOOL TOWARDS THE $0\nu\beta\beta$ NUCLEAR MATRIX ELEMENT	1
<i>C. Agodi, F. Cappuzzello, D. L. Bonanno, D. G. Bongiovanni, V. Branchina, S. Calabrese, L. Calabretta, A. Calanna, D. Carbone, M. Cavallaro, M. Colonna, A. Foti, P. Finocchiaro, V. Greco, G. Lanzalone, D. Lo Presti, F. Longhitano, A. Muoio, L. Pandola, D. Rifuggiato, S. Tudisco</i>	
ELECTRIC DIPOLE STATES AND TIME REVERSAL VIOLATION IN NUCLEI	5
<i>N. Auerbach</i>	
ON DEUTERON INTERACTIONS WITHIN SURROGATE REACTIONS AND NUCLEAR LEVEL DENSITY STUDIES	12
<i>M. Avrigeanu, V. Avrigeanu</i>	
A CONSTRAINED-PATH QUANTUM MONTE-CARLO APPROACH FOR THE NUCLEAR SHELL MODEL	19
<i>Jérémy Bonnard, Olivier Juillet</i>	
RECENT DEVELOPMENTS IN THE EIKONAL DESCRIPTION OF THE BREAKUP OF EXOTIC NUCLEI	26
<i>P. Capel, F. Colomer, H. Esbensen, T. Fukui, R. C. Johnson, F. M. Nunes, K. Ogata</i>	
NEUTRON DECAY OF THE GIANT PAIRING VIBRATION IN ^{15}C	33
<i>M. Cavallaro, C. Agodi, M. Assié, F. Azaiez, F. Cappuzzello, D. Carbone, N. De Séréville, A. Foti, L. Pandola, J. A. Scarpaci, O. Sgouros, V. Soukeras</i>	
STUDY OF HYDROGEN AND HELIUM ISOTOPES WITH $A=5,6,7$	38
<i>B. A. Chernyshev, Yu. B. Gurov, V. S. Karpukhin, L. Yu. Korotkova, S. V. Lapushkin, M. V. Tel'Kushev, V. G. Sandukovsky</i>	
INELASTIC SCATTERING OF $^{72,74}\text{Ni}$ OFF A PROTON TARGET	44
<i>M L Cortés, P Doornenbal, A Obertelli, N Pietralla, V Werner, G Authelet, H Baba, D Calvet, F Château, A Corsi, A Delbart, J-M Gheller, A Gillibert, T Isobe, V Lapoux, C Louchart, M Matsushita, S Momiyama, T Motobayashi, M Niikura, H Otsu, C Péron, A Peyaud, E C Pollacco, J-Y Roussé, H Sakurai, C Santamaria, M Sasano, Y Shiga, S Takeuchi, R Taniuchi, T Uesaka, H Wang, K Yoneda, F Browne, L X Chung, Zs Dombradi, S Franchoo, F Giacoppo, A Gottardo, K Hadynska-Klek, Z Korkulu, S Koyama, Y Kubota, J Lee, M Lettmann, R Lozeva, K Matsui, T Miyazaki, S Nishimura, L Olivier, S Ota, Z Patel, E Sahin, C M Shand, P-A Söderström, I Stefan, D Steppenbeck, T Sumikama, D Suzuki, Zs Vajta, J Wu, Z Xu</i>	
DISTORTED-WAVE BORN APPROXIMATION STUDY OF THE $^{11}\text{Li}(p,t)^9\text{Li}$ REACTION	49
<i>A A Cowley</i>	
QUARTET EXCITATIONS IN ATOMIC NUCLEI	56
<i>J. Cseh</i>	
NUCLEAR SPECTROSCOPIC PROPERTIES WITHIN A SELFCONSISTENT MULTIPHONON APPROACH	63
<i>G De Gregorio, F Knapp, N Lo Iudice, P Veselý, F Andreozzi, A Porrino</i>	
VALENCE SPACE TECHNIQUES AND QRPA VIBRATIONAL MASS PARAMETERS	70
<i>I. Deloncle, F. Lechaftois, S. Péru</i>	
ROTATIONAL BANDS IN ^{11}B AND IDENTIFICATION OF DILUTED STATES	77
<i>A S Demyanova, A N Danilov, A A Ogloblin, S A Goncharov, T L Belyaeva, W Trzaska</i>	
SEPARABLE POTENTIALS FOR (D,P) REACTION CALCULATIONS	84
<i>Ch. Elster, L. Hlophe, V. Eremenko, F. M. Nunes, I. J. Thompson, G. Arbanas, J. E. Escher</i>	
STRUCTURE OF EXOTIC MG ISOTOPES AND TEMPERATURE DEPENDENCE OF THE SYMMETRY ENERGY OF FINITE NUCLEI	91
<i>M K Gaidarov, P Sarriguren, A N Antonov, D N Kadrev, E Moya De Guerra</i>	
THE PROTON-NEUTRON SYMPLECTIC MODEL OF NUCLEAR COLLECTIVE MOTIONS	98
<i>H. G. Ganev</i>	
LIFETIMES AND ELECTROMAGNETIC TRANSITION STRENGTH IN ^{157}Dy	105
<i>K A Gladnishki, P Petkov, A Dewald, J Jolie, O Möller, B Saha, A Fitzler, K Jessen, D Tonev, T Klug, S Heinze, P Von Brentano, G Rainovski, M Trichkova, D Bazzacco, C A Ur, E Farnea, M Axiotis, S Lunardi, G De Angelis, D R Napoli, N Marginean, T Martinez, M A Caprio</i>	
BEYOND-MEAN-FIELD CORRECTIONS WITHIN THE SECOND RANDOM-PHASE APPROXIMATION	110
<i>M. Grasso, D. Gambacurta, J. Engel</i>	
THE $A = 8$ ISOTRIplet IN FERMIONIC MOLECULAR DYNAMICS	115
<i>KR Henninger</i>	

CHARGED-CURRENT INCLUSIVE NEUTRINO CROSS SECTIONS IN THE SUPERSCALING MODEL	122
<i>M. V. Ivanov, G. D. Megias, R. González-Jiménez, O. Moreno, M. B. Barbaro, J. A. Caballero, T. W. Donnelly, A. N. Antonov, E. Moya De Guerra, J. M. Udías</i>	
MANIFESTATION OF CLUSTER EFFECTS IN COLLECTIVE OCTUPOLE AND SUPERDEFORMED STATES OF HEAVY NUCLEI	129
<i>T. M. Shneidman, G. G. Adamian, N. V. Antonenko, R. V. Jolos</i>	
DOUBLE-NEUTRON CAPTURE REACTION AND NATURAL ABUNDANCE OF ¹⁸³W, ¹⁹⁵PT AND ¹⁹⁹HG ISOTOPES	135
<i>S. A. Karamian, N. V. Aksenov, G. A. Bozhikov</i>	
SEARCH FOR MIXED-SYMMETRY STATES IN ²¹²PO	140
<i>D. Kocheva, G. Rainovski, J. Jolie, N. Pietralla, C. Stahl, P. Petkov, A. Blazhev, A. Hennig, A. Astier, Th. Braunroth, L. Cortes, A. Dewald, M. Djongolov, C. Fransen, K. Gladnishki, V. Karayonchev, J. Litzinger, C. Müller-Gatermann, M. Scheck, Ph. Scholz, C. Schramm, P. Tölle, V. Werner, W. Witt, D. Wölk, P. Van Isacker</i>	
SEARCH FOR HEAVY LITHIUM ISOTOPES ¹⁰⁻¹²LI IN STOPPED PION ABSORPTION REACTIONS	147
<i>B. A. Chernyshev, Yu. B. Gurov, L. Yu. Korotkova, S. V. Lapushkin, R. V. Pritula, V. G. Sandukovskiy</i>	
HIGH PRECISION ELECTRON SCATTERING OFF ⁹⁶ZR	154
<i>C. Kremer, S. Aslanidou, S. Bassauer, A. Krugmann, N. Pietralla, V. Ponomarev, M. Singer, P. Von Neumann-Cosel, M. Zweidinger</i>	
NUCLEAR REACTIONS IN THE STORAGE RING ESR WITH EXL	159
<i>Th Kröll, M Von Schmid, J C Zamora, S Bagchi, S Böni, M Csatlós, I Dillmann, C Dimopoulou, P Egelhof, V Eremin, T Furuno, H Geissel, R Gernhäuser, M N Harakeh, A L Hartig, S Ilieva, N Kalantar-Nayestanaki, O Kiselev, H Kollmus, C Kozuharov, A Krasznahorkay, M Kuilman, S Litvinov, Yu A Litvinov, M Mahjour-Shafiei, M Mutterer, D Nagae, M A Najafi, C Nociforo, F Nolden, U Popp, C Rigollet, S Roy, C Scheidenberger, M Steck, B Streicher, L Stuhl, M Thürauf, T Uesaka, H Weick, J S Winfield, D Winters, P J Woods, T Yamaguchi, K Yue, J Zenihiro</i>	
MAGNETIC MOMENTS OF STATES IN ¹¹⁰SN	166
<i>G J Kumbartzki</i>	
DSAM LIFETIME MEASUREMENTS FOR THE CHIRAL BANDS IN ¹⁹⁴TL	171
<i>P L Masiteng, A A Pasternak, E A Lawrie, O Shirinda, J J Lawrie, R A Bark, S P Bvumbi, N Y Kheswa, R Lindsay, E O Lieder, R M Lieder, T E Madiba, S M Mullins, S H T Murray, J Ndayishimye, S S Ntshangase, P Papka, J F Sharpey-Schafer</i>	
SIMULTANEOUS OCCURRENCE OF DISTINCT SYMMETRIES IN NUCLEI	177
<i>A. Leviatan</i>	
ARE THE NUCLEI BEYOND ¹³²SN VERY EXOTIC?	184
<i>R. Lozeva, H. Naïdja, F. Nowacki, A. Odahara</i>	
CLUSTER STRUCTURE OF ⁹BE FROM ³HE+⁹BE REACTION	191
<i>S. M. Lukyanov, M. N. Harakeh, M. A. Naumenko, Yi Xu, W. H. Trzaska, V. Burjan, V. Kroha, J. Mrazek, V. Glagolev, Š. Piskor, E. I. Voskoboynik, S. V. Khlebnikov, Yu. E. Penionzhkevich, N. K. Skobelev, Yu. G. Sobolev, G. P. Tyurin, K. Kuterbekov, Yu Tuleushev</i>	
NUCLEAR CHARGE RADII AS SIGNATURE FOR STRUCTURAL CHANGES	198
<i>I Angeli, K Marinova</i>	
STUDY OF EXOTIC WEAKLY BOUND NUCLEI USING MAGNETIC ANALYZER MAVR	203
<i>V. A. Maslov, V. I. Kazacha, I. V. Kolesov, S. M. Lukyanov, V. N. Melnikov, N. F. Osipov, Yu. E. Penionzhkevich, N. K. Skobelev, Yu. G. Sobolev, E. I. Voskoboynik</i>	
LANDAU QUANTIZATION AND NEUTRON EMISSIONS BY NUCLEI IN THE CRUST OF A MAGNETAR	208
<i>N Chamel, Y D Mutafchieva, Zh K Stoyanov, L M Mihailov, R L Pavlov</i>	
THE CLUSTER AND SINGLE-PARTICLE STATES IN ¹³C (α, α)¹³C REACTIONS	215
<i>N A Mynbayev, A K Nurmukhanbetova, V Z Goldberg, G V Rogachev, M S Golovkov, M Koloberdin, I Ivanov, D K Nauruzbayev, Sh S Berdibek, A M Rakhymzhanov, R E Tribble</i>	
NUCLEI IN ASTROPHYSICS	219
<i>Yu. E. Penionzhkevich</i>	
PROTOTYPE WITH THE BASIC ARCHITECTURE FOR THE CBM-TOF INNER WALL TESTED IN CLOSE TO REAL CONDITIONS	228
<i>M. Petris, D. Bartos, G. Caragheorghopol, F. Constantin, M. Petrovici, L. Radulescu, V. Simion, I. Deppner, N. Herrmann, C. Simon, J. Frühauf, M. Kiš, P-A. Loizeau</i>	
ISOSPIN-SYMMETRY BREAKING AND SHAPE COEXISTENCE IN A~70 ANALOGS	234
<i>A. Petrovici</i>	
FIRST OBSERVATION OF THE COMPETITIVE DOUBLE-GAMMA (γ γ / γ) DECAY PROCESS	241
<i>N Pietralla, C Walz, H Scheit, T Aumann, R Lefol, V Yu Ponomarev</i>	

NUCLEAR RESONANCE FLUORESCENCE OFF ⁵⁴CR: THE ONSET OF THE PYGMY DIPOLE RESONANCE	248
<i>P C Ries, T Beck, J Beller, Krishichayan, U Gayer, J Isaak, B Löher, L Mertes, H Pai, N Pietralla, C Romig, D Savran, M Schilling, W Tornow, V Werner, M Zweidinger</i>	
TOWARDS THE IMPROVEMENT OF SPIN-ISOSPIN PROPERTIES IN NUCLEAR ENERGY DENSITY FUNCTIONALS	253
<i>X. Roca-Maza, G. Colò, H. Z. Liang, J. Meng, P. Ring, H. Sagawa, P. W. Zhao</i>	
PRODUCTION OF LANTHANIDE MOLECULAR ION BEAMS BY FLUORINATION TECHNIQUE	260
<i>B. Roussière, I. Deloncle, N. Barré-Boscher, M. A. Cardona, M. Cheikh Mhamed, T. Corbin, E. Cottureau, H. Croizet, B. Dimitrov, S. Essabaa, G. Gavrilov, A. Gottardo, N. Goutev, J. Guillot, D. Hojman, C. Lau, S. Rocca, S. Tusseau-Nenez, D. Verney, M. Yavahchova</i>	
NEAR-BARRIER NEUTRON TRANSFER IN REACTIONS ^{3,6}HE + ⁴⁵SC AND ^{3,6}HE + ¹⁹⁷AU	267
<i>V V Samarin, M A Naumenko, Yu E Penionzhkevich, N K Skobelev, V Kroha, J Mrazek</i>	
BETA-DECAY PROPERTIES OF NEUTRON-RICH MEDIUM-MASS NUCLEI	274
<i>Pedro Sarriguren</i>	
GAMOW-TELLER DECAY STUDIES WITH 2P-2H CONFIGURATIONS	281
<i>A. P. Severyukhin, V. V. Voronov, I. N. Borzov, N. N. Arsenyev, Nguyen Van Giai</i>	
MICROSCOPIC ANALYSIS OF ^{10,11}BE ELASTIC SCATTERING ON PROTONS AND ¹²C AND BREAKUP PROCESSES OF ¹¹BE WITHIN THE ¹⁰BE+N CLUSTER MODEL	286
<i>K Spasova, V K Lukyanov, D N Kadrev, A N Antonov, E V Zemlyanaya, K V Lukyanov, M K Gaidarov</i>	
INVESTIGATION OF THE MIXED-SYMMETRIC ONE-QUADRUPOLE PHONON 2⁺_{1,MS} STATE OF THE HEAVY NUCLEUS ²⁰⁴HG	293
<i>R. Stegmann, C. Stahl, G. Rainovski, N. Pietralla, T. Möller, M. Lettmann, R. V. F. Janssens, M. Carpenter, S. Zhu</i>	
NUCLEAR INDUCES EFFECTS AND MASS CORRELATIONS IN LOW AND MULTIPLY CHARGED HELIUM-LIKE IONS	298
<i>Zh K Stoyanov, R L Pavlov, L M Mihailov, Ch J Velchev, Y D Mutafchieva, D Tonev, N Chamel</i>	
CYCLOTRON LABORATORY OF THE INSTITUTE FOR NUCLEAR RESEARCH AND NUCLEAR ENERGY	305
<i>D Tonev, N Goutev, L S Georgiev</i>	
IDENTIFICATION OF LOW-ENERGY ISOVECTOR OCTUPOLE STATES IN ¹⁴⁴ND	311
<i>M Thürauf, M Scheck, C Bernards, A Blanc, N Cooper, G Defrance, M Jentschel, J Jolie, O Kaleja, U Köster, T Kröll, P Mutti, G S Simpson, T Soldner, M Tezgel, W Urban, J Vanhoy, M Werner, V Werner, K O Zell</i>	
MEDIUM-SPIN STATES OF THE NEUTRON-RICH ^{87,89}BR ISOTOPES: CONFIGURATIONS AND SHAPES	317
<i>B. M. Nyakó, J. Timár, M. Csatlós, Zs Dombrádi, A. Krasznahorkay, I. Kuti, D. Sohler, T. G. Tornyi, M. Czerwinski, T. Rzaca-Urban, W. Urban, P. Baczyk, L. Atanasova, D. L. Balabanski, K. Sieja, A. Blanc, M. Jentschel, U. Köster, P. Mutti, T. Soldner, G. De France, G. S. Simpson, C. A. Ur</i>	
HOW TO USE BENCHMARK AND CROSS-SECTION STUDIES TO IMPROVE DATA LIBRARIES AND MODELS	323
<i>V Wagner, M Suchopár, J Vrzalová, P Chudoba, O Svoboda, P Tichý, A Krása, M Majerle, A Kugler, J Adam, A Baldin, W Furman, M Kadykov, A Solnyshkin, S Tsoupko-Sitnikov, S Tyutyunikov, N Vladimirovna, L Závorka</i>	
INVESTIGATION OF CHIRALITY IN THE CASE OF ¹⁰²RH	329
<i>M. S. Yavahchova, D. Tonev, N. Goutev, G. De Angelis, P. Petkov, R. K. Bhowmik, R. P. Singh, S. Muralithar, N. Madhavan, R. Kumar, M. Kumar Raju, J. Kaur, G. Mahanto, A. Singh, N. Kaur, R. Garg, A. Sukla, Ts. K. Marinov, R. R. Mateeva, S. Brant</i>	
USING HEAVY-ION COLLISIONS TO ELUCIDATE THE ASYMMETRIC EQUATION-OF-STATE	334
<i>Sherry Yennello, Alan McIntosh</i>	
UNSTABLE NUCLEI IN COHERENT DISSOCIATION OF RELATIVISTIC NUCLEI ^{7,9}BE, ¹⁰B AND ^{10,11}C	341
<i>D A Artemenkov, V Bradnova, E Firu, N K Kornegrutsa, M Haiduc, K Z Mamatkulov, R R Kattabekov, A Neagu, P A Rukoyatkin, V V Rusakova, V R Sarkisyan, R Stanoeva, A A Zaitsev, P I Zarubin, I G Zarubina</i>	
SFF ANALYSIS OF THE SMALL ANGLE SCATTERING DATA FOR INVESTIGATION OF A VESICLE SYSTEMS STRUCTURE	348
<i>E. V. Zemlyanaya, M. A. Kiselev, E. I. Zhabiyskaya, A. Yu. Gruzinov, V. L. Aksenov, O. M. Ipatova, O. S. Druzhilovskaya</i>	
GALS - SETUP FOR PRODUCTION AND STUDY OF MULTINUCLEON TRANSFER REACTION PRODUCTS: PRESENT STATUS	353
<i>S Zemlyanoy, V Zagrebaev, E Kozulin, Yu Kudryavtsev, V Fedosseev, R Bark, Z Janas</i>	

INFLUENCE OF DIFFERENT DATA TABLES ON NEUTRON INDUCED REACTIONS IN QUASI-INFINITE ²³⁸U AND ²³²TH TARGETS IRRADIATED BY PROTONS WITH RELATIVISTIC ENERGY	359
<i>P Zhivkov, Ch Stoyanov, S Tyutyunnikov, W Furman</i>	
STUDY OF NEUTRON-DEFICIENT ISOTOPES OF FL IN THE ²³⁹PU, ²⁴⁰PU + ⁴⁸CA REACTIONS.....	363
<i>A A Voinov, V K Utyonkov, N T Brewer, Yu Ts Oganessian, K P Rykaczewski, F Sh Abdullin, S N Dmitriev, R K Grzywacz, M G Itkis, K Miernik, A N Polyakov, J B Roberto, R N Sagaidak, I V Shirokovsky, M V Shumeiko, Yu S Tsyganov, V G Subbotin, A M Sukhov, A V Sabelnikov, G K Vostokin, J H Hamilton, M A Stoyer, S Y Strauss</i>	