

List of publications of ESNT from 2004 to 2022

Publications based on works performed by physicists in the framework of the ESNT projects during their stays as visitors at CEA. In bold the one(s) directly involved as a long-stay visitor or post-doc at ESNT when the paper is prepared. These publications include directly a reference to the ESNT framework (affiliation or an acknowledgement for the support).

Updated list: <https://esnt.cea.fr/index.php?id=10&ref=1>

Liste des publications

(comportant une référence à l'ESNT, exemples : remerciements ou affiliation CEA, ESNT)

2022

◆ *Magnetic dipole moments as a strong signature for α -clustering in even-even self-conjugate nuclei*, **G. Stellan**, K.-H. Speidel, U.-G. Meißner, Eur. Phys. J. A 58, 208 (2022).
arXiv:2205.10388 doi : 10.1140/epja/s10050-022-00850-3

◆ *Structure of $^{128,129,130}\text{Xe}$ through multi-reference energy density functional calculations*, **B. Bally**, G. Giacalone, M. Bender, Eur. Phys. J. A 58, 187 (2022).
arXiv:2207.13576 doi: 10.1140/epja/s10050-022-00833-4

In preparation

• *Wave function matching for the quantum many-body problem*, S. Elhatisari, L. Bovermann, E. Epelbaum, D. Frame, F. Hildenbrand, H. Krebs, T. A. Lähde, D. Lee, N. Li, B.-N. Lu, M. Kim, Y. Kim, Y. Ma, U.-G. Meißner, G. Rupak, S. Shen, Y.-H. Song and **G. Stellan**.
ArXiv :2210.17488 (2022) [submitted to Nature].

• *The shape of gold*, **B. Bally**, G. Giacalone and M. Bender.
To be submitted to Eur. Phys. J. A (2022-2023).

• *The size of fermium nuclei across the shell closure at 152 neutrons*, E. Rickert, J. Warbinek *et al.*, (**B. Bally**). To be submitted to Nature (2022-2023).

- ◆ *Emergent four-body parameter in universal two-species bosonic systems*
L. Contessi, J. Kirscher, M.P. Valderrama,
Phys. Lett. A **408**, 127479 (2021). arXiv:2103.14711 doi : 10.1016/j.physleta.2021.127479
- ◆ *Multi-fermion systems with contact theories.*
M. Schäfer, **L. Contessi**, J. Kirscher, J. Mares,
Phys. Lett. B **816**, 136194 (2021). arXiv:2003.09862 doi: 10.1016/j.physletb.2021.136194
- ◆ *Triple-X and beyond: hadronic molecules of three and more X(3872).*
L. Contessi, J. Kirscher, M. P. Valderrama
Phys. Rev. D **103**, 056001 (2021). arXiv:2008.12268 doi: 10.1103/PhysRevD.103.056001
- ◆ *Nucleonic localisation and alpha radioactivity,*
J-P. Ebran, E. Khan, **R-D. Lasserri**,
J. Phys. G: Nucl. Part. Phys. **48**, 025106 (2021). arXiv: 2001.07436 doi:10.1088/1361-6471/abcf25
- ◆ *Bogoliubov many-body perturbation theory under constraint,*
P. Demol, M. Frosini, **A. Tichai**, V. Somà, T. Duguet
Annals of Physics **424**, 168358 (2021). arXiv:2002.02724 doi: 10.1016/j.aop.2020.168358
- ◆ *ADG: Automated generation and evaluation of many-body diagrams. II. Particle-number projected Bogoliubov many-body perturbation theory,*
P. Arthuis, **A. Tichai**, J. Ripoché, T. Duguet,
Comput. Phys. Comm. 261, 107677 (2021).
arXiv:2007.01661 doi 10.1016/j.cpc.2020.107677
Associated code available on <https://github.com/adgproject/adg/>
- ◆ *Many-body perturbation theories for finite nuclei,*
A. Tichai, R. Roth, T. Duguet,
contribution to 'Frontiers in Physics' (2020). arXiv:2001.10433 [nucl-th]
- ◆ *Symmetry reduction of tensor networks in many-body theory. I. Automated symbolic evaluation of SU(2) algebra,*
A. Tichai, R. Wirth, J. Ripoché, T. Duguet arXiv:2002.02724
Accompanying source code available at github.com/radnut/amc

- ◆ *Taming Nuclear Complexity with a Committee of Multilayer Neural Networks*,
R.-D. Lasserri, D. Regnier, J.-P. Ebran, and A. Penon,
 Phys. Rev. Lett. **124**, 162502 (2020). doi:10.1103/PhysRevLett.124.162502
- ◆ *Zero-pairing limit of Hartree-Fock-Bogoliubov reference states*,
 T. Duguet, B. Bally, **A. Tichai**,
 Phys. Rev. C **102**, 054320 (2020). arXiv:2006.02871 doi 10.1103/PhysRevC.102.054320
- ◆ *Alpha-particle condensation: A nuclear quantum phase transition*,
 J.-P. Ebran, M. Girod, E. Khan, **R.-D. Lasserri**, and P. Schuck
 Phys. Rev. C **102**, 014305 (2020).doi:10.1103/PhysRevC.102.014305
- ◆ *In-beam gamma-ray and electron spectroscopy of $^{249,251}\text{Md}$* ,
 R. Briselet, Ch. Theisen, B. Sulignano, M. Airiau, K. Auranen, D. M. Cox, F. Déchery, A. Drouart, Z. Favier,
 B. Gall, T. Goigoux, T. Grahn, P. T. Greenlees, K. Hauschild, A. Herzan, R.-D. Herzberg, U. Jakobsson, R.
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 Papadakis, P. Peura, P. Rahkila, J. Rubert, P. Ruotsalainen, M. Sandzelius, J. Sarén, C. Scholey, J. Sorri, S.
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 Phys. Rev. C **102**, 014307 (2020). doi: 10.1103/PhysRevC.102.014307
- ◆ *Microscopic description of the self-conjugate ^{108}Xe and ^{104}Te alpha-decay chain*,
 F. Mercier, J. Zhao, **R.-D. Lasserri**, J.-P. Ebran, E. Khan, T. Nikšić, and D. Vretenar,
 Phys. Rev. C **102**, 011301(R) (2020). doi:10.1103/PhysRevC.102.011301
- ◆ *Restoration of the Natural $E(1/2+1) - E(3/2+1)$ Energy Splitting in Odd-K Isotopes Towards $N = 40$* ,
 Y.L. Sun, A.Obertelli, P.Doornenbal, C.Barbieri, Y.Chazono, T.Duguet, H.N.Liu, P.Navratil, F.Nowacki,
 K.Ogata, T.Otsuka, **F.Raimondi**, V.Soma, Y.Utsuno, K.Yoshida, N.Achouri, H.Baba, F.Browne, D.Calvet,
 F.Chateau, S.Chen, N.Chiga, A.Corsi, M.L.Cortes, A.Delbart, J.-M.Gheller, A.Giganon, A.Gillibert, C.Hilaire,
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 T.Koiwai, Y.Kondo, P.Koseoglou, J.Lee, C.Lehr, B.D.Linh, T.Lokotko, M.MacCormick, K.Moschner,
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 Phys.Lett.B **802**,135215 (2020). doi: 10.1016/j.physletb.2020.135215
- ◆ *Novel chiral Hamiltonian and observables in light and medium-mass nuclei*,
 V. Somà, P. Navràtil, **F. Raimondi**, C. Barbieri, and T. Duguet,
 Phys.Rev. C **101**, 014318 (2020). doi: 10.1103/PhysRevC.101.014318
- ◆ *Improved many-body expansions from eigenvector continuation*,
 P. Demol, T. Duguet, A. Ekström, M. Frosini, K. Hebeler, S. König, D. Lee, A. Schwenk, V. Somà, **A. Tichai**,
 Phys. Rev. C **101**, 041302 (2020) arXiv:1911.12578 doi: 10.1103/PhysRevC.101.041302
- ◆ *Normal-ordered k-body approximation in particle-number-breaking theories*,
 J. Ripoche, **A. Tichai**, T. Duguet, Eur. Phys. J. A **56**, 40 (2020).
 arXiv:1908.00765 doi: 10.1140/epja/s10050-020-00045-8

- ◆ *Quasifree Neutron Knockout from ^{54}Ca Corroborates Arising $N=34$ Neutron Magic Number*, S. Chen, J. Lee, P. Doornenbal, A. Obertelli, C. Barbieri, Y. Chazono, P. Navrátil, K. Ogata, T. Otsuka, **F. Raimondi**, V. Somà, Y. Utsuno, K. Yoshida, H. Baba, F. Browne, D. Calvet, F. Château, N. Chiga, A. Corsi, M.L. Cortés, A. Delbart, J.-M. Gheller, A. Giganon, A. Gillibert, C. Hilaire, T. Isobe, J. Kahlbow, T. Kobayashi, Y. Kubota, V. Lapoux, H. N. Liu, T. Motobayashi, I. Murray, H. Otsu, V. Panin, N. Paul, W. Rodriguez, H. Sakurai, M. Sasano, D. Steppenbeck, L. Stuhl, Y.L. Sun, Y. Togano, T. Uesaka, K. Wimmer, K. Yoneda, et al., *Phys. Rev. Lett.* **123**, 142501 (2019). doi:10.1103/PhysRevLett.123.142501
- ◆ *Core-polarization effects and effective charges in O and Ni isotopes from chiral interactions*, **F. Raimondi**, C. Barbieri, *Phys. Rev. C* **100**, 024317 (2019). doi: 10.1103/PhysRevC.100.024317
- ◆ *Nuclear electromagnetic dipole response with the self-consistent Green's function formalism* **F. Raimondi**, C. Barbieri, *Phys. Rev. C* **99**, 054327 (2019). doi: 10.1103/PhysRevC.99.054327
- ◆ *Pre-processing the nuclear many-body problem: Importance truncation versus tensor factorization techniques*, **A. Tichai**, J. Ripoché, T. Duguet, *Eur. Phys. J. A* **55**, 90 (2019). doi:10.1140/epja/i2019-12758-6
- ◆ *Natural orbitals for ab initio no-core shell model calculations*, **A. Tichai**, J. Müller, K. Vobig, R. Roth, *Phys. Rev. C* **99**, 034321 (2019). doi:10.1103/PhysRevC.99.034321
- ◆ *Tensor-decomposition techniques for ab initio nuclear structure calculations: from chiral nuclear potentials to ground-state energies*, **A. Tichai**, R. Schutski, G. E. Scuseria, T. Duguet, *Phys. Rev. C* **99**, 034320 (2019). doi:10.1103/PhysRevC.99.034320
- ◆ *ADG: Automated generation and evaluation of many-body diagrams, I. Bogoliubov many-body perturbation theory*, P. Arthuis, T. Duguet, **A. Tichai**, R.-D. Lasseri, J.-P. Ebran, *Comp. Phys. Comm.* **240**, 202-227 (2019). arXiv :1809.01187 doi : 10.1016/j.cpc.2018.11.023

2018

- ◆ *Mean-field approach to reconstructed neutrino energy distributions in accelerator-based experiments*, A. Nikolakopoulos, M. Martini, M. Ericson, N. Van Dessel, R. González-Jiménez, and N. Jachowicz Phys. Rev. C **98**, 054603 (2018). doi:10.1103/PhysRevC.98.054603
Work done partially during a visit of A. Nikolakopoulos at ESNT.

- ◆ *Bogoliubov many-body perturbation theory for open-shell nuclei*, A. **Tichai**, P. Arthuis, T. Duguet, V. Somà, H. Hergert, R. Roth, Phys. Lett. B **786**, 195-200 (2018). arXiv :1806.10931, doi:10.1016/j.physletb.2018.09.044

- ◆ *Open-Shell Nuclei from No-Core Shell Model with Perturbative Improvement*, A. **Tichai**, E. Gebrerufael, K. Vobig, R. Roth, Phys. Lett. B **786**, 448-452 (2018). arXiv :1703.05664, doi:10.1016/j.physletb.2018.10.029

- ◆ *Norm overlap between many-body states: Uncorrelated overlap between arbitrary Bogoliubov product states*, B. **Bally**, T. Duguet, Phys. Rev. C **97**, 024304 (2018). arXiv: 1704.05324, doi : 10.1103/PhysRevC.97.024304

- ◆ *Neutrino-nucleus cross sections and oscillation experiments*, T. Katori, M. **Martini**, J.Phys. G **45**, 013001 (2018). arXiv:1611.07770v1

- ◆ *NuSTEC White Paper: Status and Challenges of Neutrino-Nucleus Scattering*, L. Alvarez-Ruso, M. Sajjad Athar, M.B. Barbaro, D. Cherdack, M.E. Christy, P. Coloma, T.W. Donnelly, S. Dytman, A. de Gouvea, R.J. Hill, P. Huber, N. Jachowicz, T. Katori, A.S. Kronfeld, K. Mahn, M. **Martini**, J.G. Morfin, J. Nieves, G. Perdue, R. Petti, D.G. Richards , F. Sanchez, T. Sato, J.T. Sobczyk, G.P. Zeller, *Progress in Particle and Nuclear Physics* **100**, 1 (2018). arXiv:1706.03621 ; doi:10.1016/j.pnnp.2018.01.006

- ◆ *De-excitation of the strongly coupled band in ^{177}Au and implications for core intruder configurations in the light Hg isotopes*, M. Venhart, F. A. Ali, W. Ryssens, J. L. Wood, D. T. Joss, A. N. Andreyev, K. Auranen, **B. Bally**, M. Balogh, M. Bender, et al., Phys. Rev. C **95**, 061302(R) (2017). doi: 10.1103/PhysRevC.95.061302
- ◆ *Unexpected high-energy γ emission from decaying exotic nuclei*, A. Gottardo, D. Verney, I. Deloncle, S. Peru, C. Delafosse, S. Rocchia, I. Matea, C. Sotty, C. Andreoiu, C. Costache, M.-C. Delattre, A. Etile, S. Franchoo, C. Gaulard, J. Guillot, F. Ibrahim, M. Lebois, M. MacCormick, N. Marginean, R. Marginean, **M. Martini**, C. Mihai, I. Mitu, L. Olivier, C. Portail, L. Qi, B. Roussiere, L. Stan, D. Testov, J. Wilson, D. T. Yordanov, Phys. Lett. B **772**, 359 (2017). doi: 10.1016/j.physletb.2017.06.050
- ◆ *Electromagnetic dipole and Gamow-Teller responses of even and odd $^{90-94}_{40}\text{Zr}$ isotopes in QRPA calculations with the D1M Gogny force*, I. Deloncle, S. Péru, **M. Martini**, Eur. Phys. J. A, **53** 8 (2017) 170. doi: 10.1140/epja/i2017-12354-x
- ◆ *E1 and M1 strength functions from Average Resonance Capture data*, J. Kopecky, S. Goriely, S. Péru, S. Hilaire, **M. Martini**, Phys. Rev. C **95**, 054317 (2017). doi: 10.1103/PhysRevC.95.054317
- ◆ *Are there Signatures of Harmonic Oscillator Shell Gaps Far From Stability? – First Spectroscopy of ^{110}Zr* , N. Paul, A. Corsi, A. Obertelli, P. Doornenbal, G. Authelet, H. Baba, **B. Bally**, M. Bender, D. Calvet, F. Château, S. Chen, J.-P. Delaroche, A. Delbart, J.-M. Gheller, A. Giganon, A. Gillibert, M. Girod, P. H. Heenen, V. Lapoux, J. Libert, T. Motobayashi, M. Niikura, T. Otsuka, T. R. Rodríguez, J. Y. Roussé, H. Sakurai, C. Santamaria, N. Shimizu, D. Steppenbeck, R. Taniuchi, T. Togashi, Y. Tsunoda, T. Uesaka, et al., Phys. Rev. Lett. **118**, 032501 (2017). doi: 10.1103/PhysRevLett.118.032501
Article of experimentalists from the SPhN LENA group in collaboration with theorists.
- ◆ *Beyond-mean-field correlations and the description of superheavy elements*, Paul-Henri Heenen, Benjamin Bally, Michael Bender and Wouter Ryssens, Nobel Symposium NS 160 – Chemistry and Physics of Heavy and Superheavy Elements, EPJ Web of Conferences **131**, 02001 (2016). <https://doi.org/10.1051/epjconf/201613102001>
- ◆ *Modeling the double charge exchange response function for a tetraneutron system*, R. Lazauskas, J. Carbonell, and E. Hiyama, Prog. Theor. Exp. Phys. 073D03 (2017). <https://doi.org/10.1093/ptep/ptx078>
Works partly done during the ESNT workshops organized in 2016 and 2017 “Computation of three- and four-neutron resonances” and “Dynamics of highly unstable exotic light nuclei and few-body systems”. (acknowledgements for the ESNT support).

- ◆ *Radii and binding energies in oxygen isotopes: a challenge for the nuclear forces.*
V. Lapoux, V. Somà, C. Barbieri, H. Hergert, J. D. Holt, R. Stroberg,
Phys. Rev. Lett. **117**, 052501 (2016). doi: <https://doi.org/10.1103/PhysRevLett.117.052501>
Works initiated during the ESNT workshop in April 2014, "Radioactive ion beam experiments and three-nucleon forces".
- ◆ *On the possibility of generating a 4-neutron resonance with a $T=3/2$ isospin 3-neutron force,*
J. Carbonell, E. Hiyama, R. Lazauskas, M. Kamimura, Phys. Rev. C **93**, 044004 (2016). *Works done partly during the ESNT workshop in October 2015, "Computation of three- and four-neutron resonances".*
- ◆ *Low-energy modification of the γ strength function of the odd-even nucleus ^{115}In ,*
M. Versteegen, D. Denis-Petit, V. Méot, Th. Bonnet, M. Comet, F. Gobet, F. Hannachi, M. Tarisien, P. Morel, **M. Martini**, and S. Péru, Phys. Rev. C **94**, 044325 (2016).
- ◆ *Gogny-Hartree-Fock-Bogolyubov plus quasiparticle random-phase approximation predictions of the M1 strength function and its impact on radiative neutron capture cross section,*
S. Goriely, S. Hilaire, S. Péru, **M. Martini**, I. Deloncle and F. Lechaftois, Phys. Rev. C **94**, 044306 (2016).
- ◆ *Nuclear response functions with finite range Gogny force: tensor terms and instabilities,*
A. De Pace and **M. Martini**, Phys. Rev. C **94**, 024342 (2016).
- ◆ *Large-scale deformed quasiparticle random-phase approximation calculations of the γ -ray strength function using the Gogny force,* **M. Martini**, S. Péru, S. Hilaire, S. Goriely and F. Lechaftois,
Phys. Rev. C **94**, 014304 (2016).
- ◆ *Emission of neutron-proton and proton-proton pairs in electron scattering induced by meson-exchange currents,* I. Ruiz Simo, J.E. Amaro, M.B. Barbaro, A. De Pace, J.A. Caballero, G.D. Megias, T.W. Donnelly,
Phys. Rev. C **94**, 054610 (2016); doi: 10.1103/PhysRevC.94.054610
Work discussions of the authors during the ESNT workshop held in 18-22 April 2016: "Two-body current contributions in neutrino-nucleus scattering". (Acknowledgements for the ESNT support).
- ◆ *The impact of low-energy nuclear excitations on neutrino-nucleus scattering at MiniBooNE and T2K kinematics,* V. Pandey, N. Jachowicz, **M. Martini**, R. González-Jiménez, J. Ryckebusch, T. Van Cuyck and N. Van Dessel, Phys. Rev. C **94**, 054609 (2016).
- ◆ *Influence of short-range correlations in neutrino-nucleus scattering,*
T. Van Cuyck, N. Jachowicz, R. González-Jiménez, **M. Martini**, V. Pandey, J. Ryckebusch and N. Van Dessel, Phys. Rev. C **94**, 024611 (2016).
- ◆ *Electron-neutrino scattering off nuclei from two different theoretical perspectives,*
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Phys. Rev. C **94**, 015501 (2016).
- ◆ *Assessing the role of nuclear effects in the interpretation of the MiniBooNE low-energy anomaly,*
M. Ericson, M. V. Garzelli, C. Giunti and **M. Martini**, Phys. Rev. D **93**, 073008 (2016).

2015

- ◆ *Nonobservable nature of the nuclear shell structure: Meaning, illustrations, and consequences*, T. Duguet, H. Hergert, J. D. Holt, and **V. Somà**, Phys. Rev. C **92**, 034313 (2015).
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- ◆ *Ab initio Bogoliubov coupled cluster theory for open-shell nuclei*, **A. Signoracci**, T. Duguet, G. Hagen, and G. R. Jansen, Phys. Rev. C **91**, 064320 (2015).
doi: <https://doi.org/10.1103/PhysRevC.91.064320>
- ◆ *Weakly bound Borromean structures of the exotic ${}^{6,8}\text{He}$ nuclei through direct reactions on proton*, V. Lapoux and N. Alamanos, Eur. Phys. J. A. **51**, 91 (2015).
Works discussed during the ESNT workshop in April 2014, "Radioactive ion beam experiments and three-nucleon forces".

2014

- ◆ *Ab initio-driven nuclear energy density functional method, a proposal for safe/correlated/improvable parametrizations of the off-diagonal EDF kernels*, T. Duguet, M. Bender, J.-P. Ebran, **T. Lesinski**, and V. Somà, Eur. Phys. J. A **51** 12 (2015) 162,
Topical issue, "Perspectives on Nuclear Data for the Next Decade", International Workshop PND2-2, CEA DAM, October 2014.
- ◆ *Quasiparticle coupled cluster theory for pairing interactions*, T. M. Henderson, G. E. Scuseria, J. Dukelsky, **A. Signoracci**, and T. Duguet, Phys. Rev. C **89**, 054305 (2014). doi: <https://doi.org/10.1103/PhysRevC.89.054305>
- ◆ *Density functional theory with spatial-symmetry breaking and configuration mixing*, **T. Lesinski**, Phys. Rev. C **89**, 044305 (2014).
- ◆ *Ab initio self-consistent Gorkov-Green's function calculations of semi-magic nuclei: Numerical implementation at second order with a two-nucleon interaction*, **V. Somà**, C. Barbieri, and T. Duguet, Phys. Rev. C **89**, 024323 (2014).
- ◆ **A. Signoracci** and T. Duguet, *Evaluation of errors for ESPE in neutron-rich oxygen isotopes*, in preparation.
- ◆ **G. Potel**, A. Idini, F. Barranco, E. Vigezzi, R. A. Broglia, *Pairing interaction and two-nucleon transfer reactions*, arxiv nucl-th: 1404.1317 (2014) (NB: affiliation SPhN).

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◆ *Ab-initio Gorkov-Green's function calculations of open-shell nuclei*,
V. Somà, C. Barbieri, T. Duguet, Phys. Rev. C **87**, 011303(R) (2013).

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◆ *Neutrinoless double beta decay studied with configuration mixing methods*,
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V. Somà, T. Duguet, C. Barbieri, J. Phys. Conf. Ser. **321** (2011) 012039.

◆ *Ab-initio self-consistent Gorkov-Green's function calculations of semi-magic nuclei*,
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V. Somà, T. Duguet, C. Barbieri, Phys. Rev. C **84**, 064317 (2011).

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N. Michel, W. Nazarewicz, and M. Ploszajczak, Phys. Rev. C **82**, 044315 (2010).

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M. Bender, T. Duguet, D. Lacroix, Phys. Rev. C **79**, 044319 (2009).
- ◆ *Non-empirical pairing energy functional in nuclear matter and finite nuclei*
K. Hebeler, T. Duguet, **T. Lesinski**..., submitted to PRC ; arXiv:0904.3152.
- ◆ *An "archaeological" quest for galactic supernova neutrinos*, **R. Lazauskas**, C. Lunardini and C. Volpe,
Journ. Cosmol. And Astro. Physics **04** (2009) 029.
- ◆ *Up-to N3LO heavy-baryon chiral perturbation theory calculation for the M1 properties of three-nucleon systems*, Y-Ho Song, **R. Lazauskas**, and T-S Park, Phys. Rev. C **79**, 064002 (2009).
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T. Sogo, **R. Lazauskas**, G. Röpke, and P. Schuck, Phys. Rev. C **79**, 051301 (2009).
- ◆ *Density matrix renormalization group approach to two-fluid open many-fermion systems*,
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- ◆ *Shell model in the complex energy plane*
N. Michel, W. Nazarewicz, M. Płoszajczak..., J. Phys. G:Topical Review, **36**, 013101 (2009).
- ◆ *A simple and efficient numerical scheme to integrate non-local potentials*,
N. Michel, Eur. Phys. J. A **42**, 523 (2009)
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