

Annexure-I

List of Publications:

(a) Publications in Refereed Journals :

1. "Nuclear structure and α -decay study of Og isotopes "
R. R. Swain, **B.B. Sahu**, P. K. Moharana, and S. K. Patra
Int. J. Mod. E **28**, 1950041 (2019).
I.F.: 1.386
2. "Structure and reaction dynamics of SHE $Z = 130$ "
R. R. Swain and **B.B. Sahu**
Chin. Phys. C **43**, 104103 (2019).
I.F.: 5.861
3. "Nuclear structure and decay modes of Ra isotopes within an axially deformed relativistic mean field model "
R. R. Swain, S.K. Patra and **B.B. Sahu**
Chin. Phys. C **42**, 084102 (2018).
I.F.: 5.861
4. "Importance of non-linearity in NN potential "
B. B. Sahu, S. K. Singh, M. Bhuyan, S. K. Biswal, and S. K. Patra
Phys. Rev. **C89**, 034614 (2014).
I.F.: 3.132
5. "Examining the stability of Sm nuclei around $N=100$ "
S. K. Ghorui, **B. B. Sahu**, C. R. Praharaj, and S. K. Patra
Phys. Rev. **C85**, 064327 (2012).
I.F.: 3.132
6. "Analysis of Nucleus-Nucleus Fusion Cross-Section at Extreme Sub-Barrier Energies"
Basudeb Sahu and **Bidhubhusan Sahu**

International Journal of Modern Physics E, **21**, 1250067 (2012)

I.F.: 1.386

7. "SPECTROSCOPIC STUDY OF $^{161,163}\text{Er}$ IN DEFORMED HARTREE-FOCK THEORY"
B. B. Sahu, S. K. Singh, S. K. Patra, C. R. Praharaj, M. Bhuyan, Z. Naik, and S. K. Ghorui
ACTA PHYSICA POLONICA B, **43**, 451 (2012).
I.F.: 0.998

8. "Half-lives of proton emitters using relativistic mean field theory"
Bidhubhusan Sahu, S. K. Agarwalla, and S. K. Patra
Phys. Rev. **C84**, 054604 (2011).
I.F.: 3.132

9. " α -decay and fusion phenomena in heavy ion collisions using nucleon-nucleon interactions derived from relativistic mean-field theory"
BirBikram Singh, **B. B. Sahu** and S. K. Patra,
Phys. Rev. **C83**, 064601 (2011).
I.F.: 3.132

10. "Accurate delta potential approximation for a coordinate dependent potential and its analytical solution"
Basudeb Sahu and **B. B. Sahu**,
Phys. Lett. A **373**, 4033 (2009).
I.F.: 2.087

11. "Description of scattering and fusion phenomena on $^{16}\text{O} + ^{58}\text{Ni}$ system"
Basudeb Sahu and **B. B. Sahu**,
Orissa Journal of Physics Vol. **16**, 41 (2009).
I.F.: 0

12. "Unified description of scattering and fusion phenomena in heavy-ion collisions"
Basudeb Sahu, G. S. Mallick, **B. B. Sahu**, S. K. Agarwalla and C. S. Shastri,
Phys. Rev. **C77**, 024604 (2008).
I.F.: 3.132

13. “Evaluation of eigenvalues of a smooth potential via Schrödinger transmission across multi-step potential”

Basudeb Sahu, **B. B. Sahu** and S. K. Agarwalla,
Pramana-journal of physics Vol. **70**, No.1, 27 (2008).

I.F.: 1.185

14. “**To be submitted**”

Structure of Rotational Bands and K Isomers in $^{168,170,172,174}\text{Hf}$ Nuclei

B. B. Sahu, Z. Naik, S. K. Ghorui, and C. R. Praharaaj

Abstract: The structures of $^{168,170,172,174}\text{Hf}$ nuclei are studied in the framework of deformed Hartree-Fock and angular momentum projection formalism using surface delta interaction for protons and neutrons in the $\text{sdg}_{7/2}\text{h}_{11/2}$ space (protons) and $\text{fph}_{9/2}\text{i}_{13/2}$ space (neutrons). The ground band, RAL band due to rotation-alignment of $\text{i}_{13/2}$ neutrons and the interaction of these two bands along with the excited large K bands are investigated. The $B(E2)$ values are also given and compared with the available experimental data. Spectra and electromagnetic properties of ground and K isomeric bands are also given.

(b) Conference proceedings :

1. "Alpha decay of $Z = 130$ element"
R. R. Swain and **B. B. Sahu**
DAE-BRNS Symposium on Nuclear Physics Vol. **64**, 154 (2019).
2. "Ground State Properties of Es Isotopes"
C. Dash, P. K. Moharana, I. Naik and **B. B. Sahu**
DAE-BRNS Symposium on Nuclear Physics Vol. **64**, 312 (2019).
3. "Possible shell or sub-shell closure around $A = 220$ "
R. R. Swain, C. Dash, P. K. Moharana, I. Naik, and **B. B. Sahu**
DAE-BRNS **International** Symposium on Nuclear Physics Vol. **63**, 142 (2018).
4. "Structural properties of Super-heavy Nuclei with $Z = 126$ "
R. R. Swain, S. K. Patra and **B. B. Sahu**
DAE-BRNS **International** Symposium on Nuclear Physics Vol. **63**, 224 (2018).
5. "J Selection Rule and Reduced Matrix Elements of K-Isomer Decay: $K=6^+$ Isomer Decay of ^{170}Hf to the Ground Band"
B. B. Sahu, Z. Naik, and C.R. Praharaj
DAE-BRNS **International** Symposium on Nuclear Physics Vol. **63**, 226 (2018).
6. "Formation of medium heavy mass nuclei through r-process"
R. R. Swain, S. K. Patra and **B. B. Sahu**
DAE-BRNS **International** Symposium on Nuclear Physics Vol. **63**, 792 (2018).
7. "Cluster Radioactivity Study of Pt Isotopes"
R. R. Swain, P. K. Moharana and **B. B. Sahu**
DAE-BRNS **International** Symposium on Nuclear Physics Vol. **63**, 172 (2018).
8. "Bands and Isomers in Neutron-Rich Rare-Earth Nuclei in PHF Model"
C. R. Praharaj, S. K. Ghorui, Z. Naik and **B. B. Sahu**
Proc. 14th Int. Symp. on Nuclei in the Cosmos (NIC2016) JPS Conf. Proc.**14** , 021005 (2017)
9. "Ground state properties of $Z = 118$ "
R. R. Swain, S. K. Patra and **B. B. Sahu**
DAE-BRNS Symposium on Nuclear Physics Vol. **62**, 242 (2017).
10. "Band Structures and K Isomers of ^{178}Hf "
B. B. Sahu, Z. Naik, S. K. Ghorui, S. K. Patra and C. R. Praharaj
DAE-BRNS Symposium on Nuclear Physics Vol. **62**, 244 (2017).

11. "Study Of High Spin State Of ^{50}Ti using DHF Model "
M.Kushal, **B. B. Sahu**, Z. Naik, and C. R. Praharaj
DAE-BRNS Symposium on Nuclear Physics Vol. **62**, 312 (2017).
12. " α -decay half lives of $^{294}118$ nucleus "
R.R.Swain, and **B.B.Sahu**
DAE-BRNS Symposium on Nuclear Physics Vol. **62**, 322 (2017).
13. "Isotopic dependence of fusion probabilities for oxygen nuclei and ^{92}Zr "
R.R.Swain, B. Sahu, and **B.B.Sahu**
DAE-BRNS Symposium on Nuclear Physics Vol. **62**, 644 (2017).
14. "Cluster decay of Ra isotope
R.R.Swain, and **B.B.Sahu**
DAE-BRNS Symposium on Nuclear Physics Vol. **61**, 210 (2016).
15. "Deformed Band Structures and K Isomers in ^{170}Er
B. B. Sahu, Z. Naik, S. K. Ghorui, and C. R. Praharaj DAE-BRNS Symposium on Nuclear
Physics Vol. **61**, 292 (2016).
16. "Study of K-Isomers in Hafnium Nuclei"
B. B. Sahu, Z. Naik, S. K. Ghorui, and C. R. Praharaj
DAE-BRNS Symposium on Nuclear Physics Vol. **60**, 196 (2015).
17. "Fusion Reaction Study of $^{16}\text{O}+^{92}\text{Zr}$ System"
R. R. Swain, R. K. Paira, **B. B. Sahu**, and B. Sahu
DAE-BRNS Symposium on Nuclear Physics Vol. **60**, 566 (2015).
18. " α -decay Half-lives Study of Superheavy Nuclei"
R. K. Paira, **B. B. Sahu**, and B. Sahu
DAE-BRNS Symposium on Nuclear Physics Vol. **60**, 274, (2015).
19. "Band Structure and Deformed Configurations in ^{166}Er "
B. B. Sahu, S. K. Ghorui, C. R. Praharaj, S.K. Patra, and Z. Naik
DAE-BRNS Symposium on Nuclear Physics Vol. **59**, 254 (2014).
20. "Fusion barrier distribution described by pocket resonances"
R. K. Paira, **B. B. Sahu**, and B. Sahu
DAE-BRNS Symposium on Nuclear Physics Vol. **59**, 378 (2014).
21. "Reaction Dynamics of $^6\text{Li}+^{209}\text{Bi}$ System
B. B. Sahu, R. K. Paira, and B. Sahu
DAE-BRNS Symposium on Nuclear Physics Vol. **59**, 610 (2014).

22. "High Spin Spectroscopy of ^{168}Hf Nucleus"
B. B. Sahu, S. K. Singh, Z. Naik, S.K. Patra, and C.R. Praharaaj
DAE-BRNS **International** Symposium on Nuclear Physics Vol. **58**, 246 (2013).
23. "Yrast Spectra of ^{140}Ba in Deformed Hartree-Fock and J Projection Model"
Shailesh. K. Singh, **B. B. Sahu**, C. R. Praharaaj, S. K. Patra, Z. Naik, and R. K. Bhowmik
DAE-BRNS **International** Symposium on Nuclear Physics Vol. **58**, 248 (2013).
24. "The Relativistic Lagrangian: Nucleon-Nucleon Potential"
B. B. Sahu, S. K. Singh, M. Bhuyan, and S. K. Patra
AIP Conf. Proc. Vol. **1524**, 3 (2013).
25. "The nucleon-nucleon potential from relativistic mean field theory"
B. B. Sahu, M. Bhuyan, S. K. Singh, and S. K. Patra
DAE-BRNS Symposium on Nuclear Physics Vol. **57**, 198 (2012).
26. "Spectroscopic Study of ^{171}Hf Nucleus"
B. B. Sahu, S.K. Ghorui, Z. Naik, S. K. Patra, and C.R. Praharaaj
DAE-BRNS Symposium on Nuclear Physics Vol. **57**, 246 (2012).
27. "Delay-Time in One-Dimensional Potential Scattering"
S. K. Agarwalla, **B. B. Sahu**, G. S. Mallick and B. Sahu
National Seminar on Innovative Fields of Ballistics and Applied Physics
21st January 2012, Page-115
ISBN No. 978-81-8424-746-6
28. "Study of Band Gap for One-Dimensional Periodic Potential with Position Dependent Mass"
S. K. Agarwalla, **B. B. Sahu**, G. S. Mallick and B. Sahu
National Seminar on Innovative Fields of Ballistics and Applied Physics
21st January 2012, Page-120
ISBN No. 978-81-8424-746-6
29. "Microscopic nucleon–nucleon interaction obtained from relativistic-mean-field theory and its application to nucleus decay"
B. B. Sahu and S. K. Patra
National Conference on Recent Advances in Science for Technology
(RAST-2012) February 27-28, 2012
Veer Surendra Sai University of Technology, Burla Sambalpur-768018, Odisha

30. "Microscopic study of proton emission from heavy nuclei"
B. B. Sahu, S. K. Agarwalla , and S. K. Patra
 DAE-BRNS Symposium on Nuclear Physics Vol. **56**, 516 (2011).
31. "Study of the fusion phenomena in heavy ion collisions and the α -decay using nucleon-nucleon interaction derived from relativistic mean field theory"
 BirBikram Singh, **B. B. Sahu**, and S. K. Patra
 DAE-BRNS Symposium on Nuclear Physics Vol. **56**, 546 (2011).
32. "Band Structure Study of ^{161}Er Nucleus."
B. B. Sahu, S.K. Singh, M. Bhuyan, S.K. Ghorui, Z. Naik, S.K. Patra, and C.R. Praharaj
 DAE-BRNS Symposium on Nuclear Physics Vol. **56**, 308 (2011).
33. "New form of nuclear potential for unified description of heavy-ion scattering and fusion cross sections at extreme sub-barrier energies"
 Basudeb Sahu and **B. B. Sahu**,
 DAE-BRNS Symposium on Nuclear Physics Vol. **55**, 394 (2010).
34. "Tunneling through a composite potential and understanding deep sub-barrier fusion reactions"
 Basudeb Sahu and **B. B. Sahu**,
 DAE-BRNS **International** Symposium on Nuclear Physics Vol. **54**, 302 (2009).
35. " Study of scattering and fusion cross sections for $^{16}\text{O} + ^{58,62}\text{Ni}$ around Coulomb barrier"
B. B. Sahu and Basudeb Sahu,
 DAE-BRNS **International** Symposium on Nuclear Physics Vol. **54**, 290 (2009).
36. " Analysis of scattering and fusion in $^{19}\text{F} + ^{208}\text{Pb}$ system"
 Basudeb Sahu, **B. B. Sahu**, P. Prema, and C. S. Shastry
 DAE-BRNS Symposium on Nuclear Physics Vol. **53**, 423 (2008).
37. " Channel coupling through oscillation modulated vibratory driving field in nucleus-nucleus collision"
 Basudeb Sahu, **B. B. Sahu**, and P. Prema
 DAE-BRNS Symposium on Nuclear Physics Vol. **53**, 418 (2008).
38. "Multi-step potential approximation for evaluation of eigenvalues of smooth potential"
 Basudeb Sahu, **B. B. Sahu** and S. K. Agarwalla, *Bulletin of Orissa Physical Society* Vol. **XV**, 47 (2008).
39. " Qunatum mechanical alpha decay rate of superheavy elements"
 Basudeb Sahu, **B. B. Sahu**, S. K. Agarwalla, Y. K. Gambhir and C. S. Shastry
 DAE-BRNS Symposium on Nuclear Physics Vol. **52**, 427 (2007).

40. “ Simultaneous description of scattering and fusion on $^{16}\text{O} + ^{208}\text{Pb}$ ”
Basudeb Sahu, G. S. Mallick, **B. B. Sahu**, S. K. Agarwalla, and C. S. Shastry
DAE-BRNS Symposium on Nuclear Physics Vol. **52**, 319 (2007).
41. “ Profuse sub-barrier tunneling through a repulsive potential supported by attractive wells on either side ”
Basudeb Sahu, S. K. Agarwalla, G. S. Mallick, **B. B. Sahu**, and C. S. Shastry
DAE-BRNS Symposium on Nuclear Physics Vol. **51**, 451 (2006).
42. “ Versatility of Ginocchio type potential barrier in nucleus-nucleus collisions ”
S. K. Agarwalla, Basudeb Sahu, G. S. Mallick, **B. B. Sahu**, and C. S. Shastry
DAE-BRNS Symposium on Nuclear Physics Vol. **51**, 389 (2006).
43. “ Resonances in the barrier region”
P. Prema, S. Mahadevan, S. K. Agarwalla, G. S. Mallick, **B. B. Sahu**, Basudeb Sahu and C. S. Shastry
DAE-BRNS Symposium on Nuclear Physics Vol. **51**, 339 (2006).