

## Prof. ORHAN BAYRAK

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### International Researcher IDs

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Publons / Web Of Science ResearcherID: A-3110-2016

Yoksis Researcher ID: 182220

### Education Information

Doctorate, Erciyes University, Fen Bilimleri, Fizik, Turkey 2005 - 2009

### Research Areas

Physics, Atomic and Molecular Physics, Nuclear physics, Natural Sciences

### Academic Titles / Tasks

Professor, Akdeniz University, Faculty of Science, Department of Physics, 2017 - Continues

Associate Professor, Akdeniz University, Faculty of Science, Department of Physics, 2013 - 2017

Assistant Professor, Akdeniz University, Faculty of Science, Department of Physics, 2010 - 2013

### Academic and Administrative Experience

Head of Department, Akdeniz University, Faculty Of Science, Department of Physics, 2014 - 2023

Fakülte Kurulu Üyesi, Akdeniz University, Faculty Of Science, Department of Physics, 2017 - 2020

Fakülte Yönetim Kurulu Üyesi, Akdeniz University, Faculty Of Science, Department of Physics, 2017 - 2020

Head of Department, Akdeniz University, Faculty Of Science, Fizik, 2017 - 2020

Akdeniz University, 2012 - 2016

### Advising Theses

Bayrak O., Radyasyon tedavilerinde kullanılan ağır iyonların X-ışınına karşı üstünlüklerinin radyobiyojik ve dozimetrik parametreler üzerinden araştırılması, Doctorate, N.İLKER(Student), 2020

Bayrak O., Genelleştirilmiş Woods-Saxon Potansiyel Alanında Spin-0 Parçacıklarının Davranışı, Postgraduate, D.Şahin(Student), 2019

BAYRAK O., Düşük Enerji Bölgesinde 156Gd Çekirdeğinin Teorik ve Deneysel İncelenmesi, Doctorate, E.AÇIKSÖZ(Student), 2016

## Published journal articles indexed by SCI, SSCI, and AHCI

- I. **Optical properties of a quantum dot confined in inverse square root truncated exponential potential under varied conditions of temperature, hydrostatic pressure, and electric/magnetic fields**  
BAYRAK K., KAYA D., BAYRAK O.  
European Physical Journal Plus, vol.139, no.8, 2024 (SCI-Expanded)
- II. **The effect of position-dependent effective mass on the optical properties of a spherical quantum dot confined in inverse square root truncated and deformed exponential potential**  
BAYRAK K., KAYA D., BAYRAK O.  
European Physical Journal Plus, vol.138, no.6, 2023 (SCI-Expanded)
- III. **The total absorption coefficient and refractive index change of a spherical quantum dot in the confinement radial potential**  
Kaya D., Yücel M. B., Bayrak O.  
PHYSICA B: CONDENSED MATTER, vol.648, no.2023, pp.1-8, 2023 (SCI-Expanded)
- IV. **Clustering effect in description of the alpha and heavier decay half-life**  
Dagtas R., BAYRAK O.  
Physica Scripta, vol.97, no.10, 2022 (SCI-Expanded)
- V. **NEW PREDICTIONS ON ALPHA DECAY HALF-LIVES OF SUPERHEAVY NUCLEI**  
Dagtas R., BAYRAK O.  
Acta Physica Polonica B, vol.53, no.9, 2022 (SCI-Expanded)
- VI. **Pocket resonances in low-energy antineutron reactions with nuclei**  
Lee T., BAYRAK O., Wong C.  
PHYSICS LETTERS B, vol.817, 2021 (SCI-Expanded)
- VII. **Bound state solutions of the Klein-Gordon equation with energy-dependent potentials**  
LÜTFÜOĞLU B. C., İkot A. N., Karakoc M., Osobonye G. T., Ngiangia A. T., Bayrak O.  
MODERN PHYSICS LETTERS A, vol.36, no.4, 2021 (SCI-Expanded)
- VIII. **A new simple model for the alpha-decay**  
Bayrak O.  
JOURNAL OF PHYSICS G-NUCLEAR AND PARTICLE PHYSICS, vol.47, no.2, 2020 (SCI-Expanded)
- IX. **Investigation of deformation effects on the decay properties of C-12 + alpha Cluster states in O-16**  
Soylu A., Koyuncu F., Cohan A., BAYRAK O., Freer M.  
ANNALS OF PHYSICS, vol.391, pp.263-277, 2018 (SCI-Expanded)
- X. **Binary cluster model calculations for Ne-20 and Ti-44 nuclei**  
Koyuncu F., Soylu A., BAYRAK O.  
MODERN PHYSICS LETTERS A, vol.32, no.9, 2017 (SCI-Expanded)
- XI. **Binding energy of the donor impurities in GaAs-Ga<sub>1-x</sub>Al<sub>x</sub>As quantum well wires with Morse potential in the presence of electric and magnetic fields**  
Aciksoz E., BAYRAK O., Soylu A.  
CHINESE PHYSICS B, vol.25, no.10, 2016 (SCI-Expanded)
- XII. **Scattering, bound, and quasi-bound states of the generalized symmetric Woods-Saxon potential**  
LÜTFÜOĞLU B. C., Akdeniz F., BAYRAK O.  
JOURNAL OF MATHEMATICAL PHYSICS, vol.57, no.3, 2016 (SCI-Expanded)
- XIII. **Exact Analytical Solution of the Klein-Gordon Equation in the Generalized Woods-Saxon Potential**  
BAYRAK O., SAHIN D.  
COMMUNICATIONS IN THEORETICAL PHYSICS, vol.64, no.3, pp.259-262, 2015 (SCI-Expanded)
- XIV. **alpha-alpha folding cluster model for alpha-radioactivity**  
Soylu A., BAYRAK O.

- EUROPEAN PHYSICAL JOURNAL A, vol.51, no.4, 2015 (SCI-Expanded)
- XV. **Corrected analytical solution of the generalized Woods-Saxon potential for arbitrary  $l$  states**  
BAYRAK O., Aciksoz E.  
PHYSICA SCRIPTA, vol.90, no.1, 2015 (SCI-Expanded)
- XVI. **Effect of external fields on the energies of hydrogenic donor with the anharmonic confinement potential**  
Aciksoz E., BAYRAK O., SOYLU A.  
PHYSICA B-CONDENSED MATTER, vol.456, pp.339-343, 2015 (SCI-Expanded)
- XVII. **Bound states of the Dirac equation for the generalized Woods-Saxon potential in pseudospin and spin symmetry limits**  
CANDEMIR N., Bayrak O.  
MODERN PHYSICS LETTERS A, vol.29, no.35, 2014 (SCI-Expanded)
- XVIII. **Massive Dirac equation in asymmetric Hulthen potential**  
Candemir N., BAYRAK O.  
JOURNAL OF MATHEMATICAL PHYSICS, vol.54, no.4, 2013 (SCI-Expanded)
- XIX. **Role of the cluster deformations in explaining the exotic decay half-lives**  
Soylu A., SERT Y., BAYRAK O., BOZTOSUN İ.  
EUROPEAN PHYSICAL JOURNAL A, vol.48, no.9, 2012 (SCI-Expanded)
- XX. **Effect of the velocity-dependent potentials on the energy eigenvalues of the Morse potential**  
Soylu A., BAYRAK O., BOZTOSUN İ.  
CENTRAL EUROPEAN JOURNAL OF PHYSICS, vol.10, no.4, pp.953-959, 2012 (SCI-Expanded)
- XXI. **RADIAL SENSITIVITY OF THE ELASTIC SCATTERING AROUND THE COULOMB BARRIER ENERGIES FOR WEAKLY-BOUND AND HALO NUCLEI**  
SERT Y., CANER T., BAYRAK O., BOZTOSUN İ.  
MODERN PHYSICS LETTERS A, vol.27, no.21, 2012 (SCI-Expanded)
- XXII. **Supersymmetric solution of Schrodinger equation by using the asymptotic iteration method**  
KOÇAK G., BAYRAK O., BOZTOSUN İ.  
ANNALEN DER PHYSIK, vol.524, no.6-7, pp.353-359, 2012 (SCI-Expanded)
- XXIII. **Effect of nuclear deformation on alpha-decay half-lives**  
ÇOBAN A. Y., BAYRAK O., Soylu A., BOZTOSUN İ.  
PHYSICAL REVIEW C, vol.85, no.4, 2012 (SCI-Expanded)
- XXIV. **Phase shift analysis of the He-6+Pb-208 and the He-6+Au-197 systems**  
BAYRAK O., BOZTOSUN İ.  
CENTRAL EUROPEAN JOURNAL OF PHYSICS, vol.10, no.1, pp.109-115, 2012 (SCI-Expanded)
- XXV. **The energy eigenvalues of the Kratzer potential in the presence of a magnetic field**  
Aygün M., BAYRAK O., BOZTOSUN İ., ŞAHİN Y.  
EUROPEAN PHYSICAL JOURNAL D, vol.66, no.2, 2012 (SCI-Expanded)
- XXVI. **Effect of the Velocity-Dependent Potentials on the Bound State Energy Eigenvalues**  
BAYRAK O., Soylu A., BOZTOSUN İ.  
CHINESE PHYSICS LETTERS, vol.28, no.4, 2011 (SCI-Expanded)
- XXVII. **Semiclassical description of the He-6+C-12 elastic scattering**  
BAYRAK O., BOZTOSUN İ.  
PHYSICS OF ATOMIC NUCLEI, vol.74, no.1, pp.13-18, 2011 (SCI-Expanded)
- XXVIII. **The relativistic treatment of spin-0 particles under the rotating Morse oscillator**  
BAYRAK O., Soylu A., BOZTOSUN İ.  
JOURNAL OF MATHEMATICAL PHYSICS, vol.51, no.11, 2010 (SCI-Expanded)
- XXIX. **Analytical solution of the Schrodinger equation for Makarov potential with any  $l$  angular momentum**  
Bayrak O., Karakoc M., Boztosun I., Sever R.  
INTERNATIONAL JOURNAL OF THEORETICAL PHYSICS, vol.47, no.11, pp.3005-3014, 2008 (SCI-Expanded)
- XXX. **Exact solutions of Klein-Gordon equation with scalar and vector Rosen-Morse-type potentials**  
Soylu A., BAYRAK O., Boztosun I.

CHINESE PHYSICS LETTERS, vol.25, no.8, pp.2754-2757, 2008 (SCI-Expanded)

- XXXI. **Exact solutions of Klein-Gordon equation with exponential scalar and vector potentials**  
Taskin F., Boztosun I., BAYRAK O.  
INTERNATIONAL JOURNAL OF THEORETICAL PHYSICS, vol.47, no.6, pp.1612-1617, 2008 (SCI-Expanded)
- XXXII. **kappa state solutions of the Dirac equation for the Eckart potential with pseudospin and spin symmetry**  
Soylu A., BAYRAK O., Boztosun I.  
JOURNAL OF PHYSICS A-MATHEMATICAL AND THEORETICAL, vol.41, no.6, 2008 (SCI-Expanded)
- XXXIII. **Arbitrary l-state solution of the Hellmann potential**  
KOÇAK G., BAYRAK O., Boztosun I.  
JOURNAL OF THEORETICAL & COMPUTATIONAL CHEMISTRY, vol.6, no.4, pp.893-903, 2007 (SCI-Expanded)
- XXXIV. **An alternative accurate solution of the exponential cosine screened Coulomb potential**  
Bayrak O., Boztosun I.  
INTERNATIONAL JOURNAL OF MODERN PHYSICS C, vol.18, no.9, pp.1443-1451, 2007 (SCI-Expanded)
- XXXV. **The pseudospin symmetric solution of the Morse potential for any kappa state**  
BAYRAK O., Boztosun I.  
JOURNAL OF PHYSICS A-MATHEMATICAL AND THEORETICAL, vol.40, no.36, pp.11119-11127, 2007 (SCI-Expanded)
- XXXVI. **An approximate solution of Dirac-Hulthen problem with pseudospin and spin symmetry for any kappa state**  
Soylu A., Bayrak O., Boztosun I.  
JOURNAL OF MATHEMATICAL PHYSICS, vol.48, no.8, 2007 (SCI-Expanded)
- XXXVII. **Bound state solutions of the Hulthen potential by using the asymptotic iteration method**  
Bayrak O., Boztosun I.  
PHYSICA SCRIPTA, vol.76, no.1, pp.92-96, 2007 (SCI-Expanded)
- XXXVIII. **Application of the asymptotic iteration method to the exponential cosine screened coulomb potential**  
Bayrak O., Boztosun I.  
INTERNATIONAL JOURNAL OF QUANTUM CHEMISTRY, vol.107, no.5, pp.1040-1045, 2007 (SCI-Expanded)
- XXXIX. **Exact analytical solutions to the Kratzer potential by the asymptotic iteration method**  
Bayrak O., Boztosun I., Ciftci H.  
INTERNATIONAL JOURNAL OF QUANTUM CHEMISTRY, vol.107, no.3, pp.540-544, 2007 (SCI-Expanded)
- XL. **Solution of the radial Schrodinger equation for the potential family  $V(r)=(A)/(r^2)-(B)/r+Cr-kappa$  using the asymptotic iteration method**  
Aygun M., Bayrak O., Boztosun I.  
JOURNAL OF PHYSICS B-ATOMIC MOLECULAR AND OPTICAL PHYSICS, vol.40, no.3, pp.537-544, 2007 (SCI-Expanded)
- XLI. **Any l-state solutions of the Hulthen potential by the asymptotic iteration method**  
Bayrak O., Kocak G., Boztosun I.  
JOURNAL OF PHYSICS A-MATHEMATICAL AND GENERAL, vol.39, no.37, pp.11521-11529, 2006 (SCI-Expanded)
- XLII. **The energy eigenvalues of the two dimensional hydrogen atom in a magnetic field**  
Soylut A., Bayrak O., Boztosun I.  
INTERNATIONAL JOURNAL OF MODERN PHYSICS E, vol.15, no.6, pp.1263-1271, 2006 (SCI-Expanded)
- XLIII. **Arbitrary l-state solutions of the rotating Morse potential by the asymptotic iteration method**  
Bayrak O., Boztosun I.  
JOURNAL OF PHYSICS A-MATHEMATICAL AND GENERAL, vol.39, no.22, pp.6955-6963, 2006 (SCI-Expanded)
- XLIV. **The examination of the C-12+Mg-24 elastic scattering around the Coulomb barrier**  
Boztosun I., Dagdemir Y., Bayrak O.  
PHYSICS OF ATOMIC NUCLEI, vol.68, no.7, pp.1153-1159, 2005 (SCI-Expanded)
- XLV. **A comparative study of the C-12+Mg-24 system with deep and shallow potentials**  
Boztosun I., Bayrak O., Dagdemir Y.  
INTERNATIONAL JOURNAL OF MODERN PHYSICS E-NUCLEAR PHYSICS, vol.14, no.4, pp.663-673, 2005 (SCI-

Expanded)

## Articles Published in Other Journals

- I. **Elastic scattering analysis of  $^{12}\text{C}^{24}\text{Mg}$  by WKB method**  
BAYRAK O.  
TURKISH JOURNAL OF PHYSICS, vol.41, pp.1, 2017 (Scopus)
- II. **Microscopic Analysis of Elastic Scattering of  $^7\text{Be}$ ,  $^9\text{Be}$ ,  $^{10}\text{B}$ ,  $^{12}\text{C}$ ,  $^{14}\text{N}$ ,  $^{27}\text{Al}$ ,  $^{58}\text{Ni}$  and  $^{208}\text{Pb}$  Systems,**  
AYGÜN M., BAYRAK O., AYGÜN Z.  
Quantum Physics Letters, 2017 (Peer-Reviewed Journal)
- III. **Elastic scattering analysis of  $\text{C-}^{12}+\text{Mg-}^{24}$  by WKB method**  
BAYRAK O.  
TURKISH JOURNAL OF PHYSICS, vol.41, no.6, pp.520-525, 2017 (ESCI)

## Refereed Congress / Symposium Publications in Proceedings

- I. **Non-relativistic solutions of the generalized symmetric Woods-Saxon potential**  
LÜTFÜOĞLU B. C., Akdeniz F., BAYRAK O.  
VII Conference on Quantum Foundations, Cordoba, Argentina, 28 November - 01 December 2017
- II. **Non relativistic solutions of the generalized symmetric Woods-Saxon potential**  
LÜTFÜOĞLU B. C., Akdeniz F., BAYRAK O.  
VII Conference on Quantum Foundations: 90 years of Uncertainty, Cordoba, Argentina, 29 November - 01 December 2017, vol.1, no.1, pp.8
- III. **Non relativistic solutions of the generalized symmetric Woods-Saxon potential**  
LÜTFÜOĞLU B. C., Akdeniz F., BAYRAK O.  
VII Conference on Quantum Foundations: 90 years of Uncertainty, Cordoba, Argentina, 29 November - 01 December 2017, vol.1, no.1, pp.8
- IV. **Cluster Model Calculations for  $^{44}\text{Ti}$**   
koyuncu f., SOYLU A., BAYRAK O.  
IX. INTERNATIONAL WORKSHOP ONNUCLEAR STRUCTURE PROPERTIES, 1 - 03 September 2016
- V. **Analytical Solution of Schrödinger equation for generalized symmetric Woods-Saxon potential: Scattering, bound and quasi-bound states.**  
LÜTFÜOĞLU B. C., Akdeniz F., BAYRAK O.  
ICQSA 2016, Eskişehir, Turkey, 25 - 27 May 2016, pp.120
- VI. **The influence of nuclear deformations on the exotic cluster decay half-lives**  
SOYLU A., BAYRAK O., EVLICE S.  
1st NUBA International Conference on Nuclear Physics and Astrophysics, Antalya, Turkey, 14 - 21 September 2014, vol.590
- VII. **Analytical solution of the Morse and the Hulthen potentials by using asymptotic iteration method**  
BAYRAK O., Boztosun I.  
6th International Conference of the Balkan-Physical-Union, İstanbul, Turkey, 22 - 26 August 2006, vol.899, pp.353-354
- VIII.  **$^{12}\text{C}+^{24}\text{Mg}$  Sisteminin Mikroskopik ve Fenomonolojik Modellerle İncelenmesi**  
BAYRAK O., BOZTOSUN İ., DAĞDEMİR Y.  
Türk Fizik Derneği 22. Uluslararası Fizik Kongresi, Turkey, 14 - 17 September 2004
- IX.  **$^{12}\text{C}+^{24}\text{Mg}$  Sistemi: Derin ve Sığ potansiyeller Arasındaki Simetri**  
BAYRAK O., BOZTOSUN İ., DAĞDEMİR Y.  
VIII. Ulusal Nükleer Bilimler ve Teknolojileri Kongresi, Turkey, 15 - 17 October 2003

## Supported Projects

- BAYRAK O., Project Supported by Higher Education Institutions, Nükleer Küme Bozunum Mekanizmaları için Morse Potansiyeli, 2019 - 2024
- BAYRAK O., AÇIKSÖZ E., BOZTOSUN İ., Project Supported by Higher Education Institutions, Exact Analytical Solution of the KleinGordon Equation in the Generalized Woods-Saxon Potential, 2016 - 2019
- BAYRAK O., AÇIKSÖZ E., Project Supported by Higher Education Institutions, Bound states of the Dirac Equation for the generalized WoodsSaxon potential in pseudospin and spin symmetry limits, 2015 - 2018
- BAYRAK O., AÇIKSÖZ E., Project Supported by Higher Education Institutions, alphaalpha folding cluster model for alphanradioactivity, 2015 - 2018
- LÜTFÜOĞLU B. C., BAYRAK O., IKOT A. N., Project Supported by Higher Education Institutions, Klein-Gordon equation particles in exponential-type molecule potentials and their thermodynamic properties in D dimensions, 2017 - 2017
- Bayrak O., Project Supported by Higher Education Institutions, Alfa Kümelene Potansiyeli Kullanılarak 24Mg Çekirdeğinin Nükleer Yapı ve Rezonans Gözlenirlerinin İncelenmesi, 2015 - 2016
- Bayrak O., TUBITAK Project, Hafif Orta Ve Ağır Çekirdeklerin Nükleer Yapı ve Reaksiyon Gözlenirlerinin Kümelene Modeli Kullanarak Teorik Olarak İncelenmesi, 2015 - 2016
- Bayrak O., TUBITAK Project, Ağır Çekirdeklerin Alfa Bozunum Mekanizmalarının İncelenmesi, 2011 - 2012
- Bayrak O., TUBITAK Project, Nükleer Fizik ve Astrofizikteki Reaksiyon Gözlenebilirlerine Transfer ve Quasi Elastik Reaksiyonların Etkisi, 2007 - 2009
- Bayrak O., TUBITAK Project, Nükleer Kümelene Nükleer Yapı ve Reaksiyon Formalizmine Uygulanması, 2006 - 2008
- Bayrak O., Project Supported by Higher Education Institutions, Hafif Ağır Çekirdek Reaksiyonlarının Açıklanması İçin Yeni Bir Potansiyel Yaklaşımı, 2006 - 2007

## Scientific Refereeing

- Physics Research International , SCI Journal, February 2016
- Zeitschrift fur Naturforschung A , SCI Journal, February 2016
- Scientific Reports , SCI Journal, February 2016
- Physica B , SCI Journal, February 2016
- ISRN Mathematical Physics , SCI Journal, February 2015
- International Journal of Theoretical Physics , SCI Journal, February 2015
- Indian Journal of Physics , SCI Journal, February 2015
- Journal of Mathematical Physics , SCI Journal, February 2014
- Bitlis Eren University Journal of Science And Technology , National Scientific Refreed Journal, February 2014
- Journal of Theoretical and Applied Physics , SCI Journal, February 2014
- The journal Few-Body Systems , SCI Journal, February 2013
- Central European Journal of Physics , SCI Journal, February 2013
- Advances in High Energy Physics , SCI Journal, February 2013
- Physica Scripta , SCI Journal, February 2012

## Metrics

- Publication: 57
- Citation (WoS): 1145
- Citation (Scopus): 1341
- H-Index (WoS): 17
- H-Index (Scopus): 18

## Scholarships

2218-Yurt İçi Doktora Sonrası Burs Programı , TUBITAK, 2010 - 2011