



# EMRE BAHADIR AL

## ASSOC. PROF.

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### International Researcher IDs

ScholarID: R\_l8hkAAAAJ

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Publons / Web Of Science ResearcherID: ABE-2951-2020

ScopusID: 57023825300

Yoksis Researcher ID: 54990



### Learning Knowledge

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Doctorate 2014 - 2020	Sivas Cumhuriyet University, Fen Fakültesi, Fizik Bölümü, Turkey
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Postgraduate 2011 - 2014	Sivas Cumhuriyet University, Fen Fakültesi, Fizik Bölümü, Turkey
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Undergraduate 2005 - 2009	Firat University, Faculty Of Science, Department Of Physics, Turkey
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### Foreign Languages

English, B2 Upper Intermediate

### Dissertations

Doctorate, Electronic and Optical Properties of the Spherical Quantum Dots Under the Magnetic Field, Sivas Cumhuriyet University, Fen Fakültesi, Fizik Bölümü, 2020

Postgraduate, INFRARED TRANSITIONS BETWEEN HYDROGENIC STATES IN GaInNAs/GaAs QUANTUM WELLS, Sivas Cumhuriyet University, Fen Fakültesi, Fizik Bölümü, 2014

### Academic Titles / Tasks

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Associate Professor  
2023 - Continues

Sivas Cumhuriyet University, Fen Fakültesi, Fizik Bölümü

Assistant Professor  
2022 - 2023

Sivas Cumhuriyet University, Fen Fakültesi, Fizik Bölümü

Research Assistant PhD  
2020 - 2022

Sivas Cumhuriyet University, Fen Fakültesi, Fizik Bölümü

Research Assistant  
2011 - 2020

Sivas Cumhuriyet University, Fen Fakültesi, Fizik Bölümü

## Supported Projects

1. Al E. B., Project Supported by Higher Education Institutions, Effect of magnetic field and size modulation on linear and nonlinear intersubband optical properties of a single donor dopant in a spherical core/shell/shell semiconductor quantum dot, 2021 - 2022
2. Kasapoğlu E., Al E. B., Project Supported by Higher Education Institutions, Manyetik Alan Altında Küresel Kuantum Noktalarının Elektronik Ve Optik Özellikleri, 2017 - 2020
3. Kasapoğlu E., Öztürk E., Al E. B., Project Supported by Higher Education Institutions, Binding Energies and Optical Transitions of Impurity Atoms in the Double Quantum Well with Lennard Jones Potential , 2017 - 2018
4. Kasapoğlu E., Öztürk E., Al E. B., Project Supported by Higher Education Institutions, The effect of external fields on linear and nonlinear optical properties of Tietz-Hua quantum well, 2017 - 2017
5. Kasapoğlu E., Öztürk E., Al E. B., Project Supported by Higher Education Institutions, The effect of external fields on the optical properties of the asymmetric parabolic quantum well., 2016 - 2016
6. Ungan F., Al E. B., Project Supported by Higher Education Institutions, Yoğun lazer alanı altındaki asimetric çift kare kuantum kuyusunun ikinci ve üçüncü dereceden doğrusal olmayan optiksel özellikleri, 2016 - 2016

## Awards

1. Al E. B., APED, Sivas Cumhuriyet Üniversitesi, May 2024
2. Al E. B., Akademik Teşvik, Yök, February 2024
3. Al E. B., Yayın Teşvik (UBYT), Tübitak, December 2023
4. Al E. B., Yayın Teşvik (UBYT), Tübitak, October 2023
5. Al E. B., APED, Sivas Cumhuriyet Üniversitesi, September 2023
6. Al E. B., Yayın Teşvik (UBYT), Tübitak, September 2023
7. Al E. B., Bilim Ödülleri, Sivas Cumhuriyet Üniversitesi Bilimsel Araştırma Projeleri Koordinasyon Birimi, May 2023
8. Al E. B., Akademik Teşvik, Yök, February 2023
9. Al E. B., Yayın Teşvik (UBYT), Tübitak, December 2022
10. Al E. B., Yayın Teşvik (UBYT), Tübitak, November 2022
11. Al E. B., APED, Sivas Cumhuriyet Üniversitesi, July 2022
12. Al E. B., Akademik Teşvik, Yök, February 2022
13. Al E. B., APED, Sivas Cumhuriyet Üniversitesi, November 2021
14. Ayazlı İ. E., AL E. B., AKADEMİK TEŞVİK, Yök, February 2017
15. Ayazlı İ. E., AYAZLI Ö., AL E. B., AKADEMİK TEŞVİK, Yök, February 2016

## Jury Memberships

Doctorate, Doctorate, Firat Üniversitesi, December, 2023

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

- 1. Nonlinear optical properties of GaAs/AlGaAs asymmetric triple quantum wells designed for quantum cascade lasers: Effect of externally applied electric and magnetic fields**  
Turker Tuzemen A. T., Dakhlaoui H., Mora-Ramos M., Al E. B., Ungan F.  
Physica B: Condensed Matter, vol.690, 2024 (SCI-Expanded)
- 2. Effects of doping concentrations and position-dependent mass on the nonlinear optical properties of asymmetric double delta-doped GaAs quantum wells**  
Salman Durmuslar A., AL E. B., Althib H., Mora-Ramos M., UNGAN F.  
Applied Physics B: Lasers and Optics, vol.130, no.10, 2024 (SCI-Expanded)
- 3. Effects of hydrostatic pressure, temperature, and position-dependent mass on the nonlinear optical properties of triple delta-doped GaAs quantum well**  
TÜZEMEN A. T., AL E. B., Sayrac H., Dakhlaoui H., Mora-Ramos M., UNGAN F.  
European Physical Journal Plus, vol.139, no.8, 2024 (SCI-Expanded)
- 4. Effects of electric and magnetic fields on the electronic properties in the asymmetrical biconvex lens-shaped GaAs/GaAlAs quantum dots**  
Al E. B., Restrepo R., Morales A., Mora-Rey F., Sosa-Giraldo T.  
PHYSICA B: CONDENSED MATTER, vol.683, pp.415903, 2024 (SCI-Expanded)
- 5. Modeling of electronic spectra and optical responses of a semiconductor AlGaAs/GaAs quantum well with three-step barriers: the role of external perturbations and impurity**  
Haghighatzadeh A., Attarzadeh A., Salman Durmuslar A., AL E. B., UNGAN F.  
European Physical Journal Plus, vol.139, no.4, 2024 (SCI-Expanded)
- 6. The effects of temperature and pressure on optical properties of spherical core/shell/shell quantum dot**  
AL E. B.  
Indian Journal of Physics, 2024 (SCI-Expanded)
- 7. Donor Impurity Related Linear and Nonlinear Optical Properties of Symmetric and Asymmetric Double Triangular Quantum Dots**  
AL E. B., Ali N., Aljunid S. A., Endut R., Yusof N. R.  
IEEE Access, 2024 (SCI-Expanded)
- 8. Influence of hydrostatic pressure and temperature on the optical responses of asymmetric triple quantum wells**  
Durmuslar A. S., Dakhlaoui H., Al E. B., Ungan F.  
European Physical Journal Plus, vol.139, no.1, 2024 (SCI-Expanded)
- 9. Influence of perturbations on linear and nonlinear optical properties of quantum dot**  
Edet C., AL E. B., UNGAN F., Inyang E. P., Ali N., Ramli M., Endut R., Aljunid S.  
European Physical Journal Plus, vol.138, no.10, 2023 (SCI-Expanded)
- 10. Effects of rare earth element Gd on microstructure, thermodynamic parameters, mechanical, and shape recovery properties of CuAlTa alloys**  
Ercan E., Al E. B., Dağdelen F.  
Journal of Thermal Analysis and Calorimetry, vol.1, pp.1-12, 2023 (SCI-Expanded)
- 11. Effects of external electric and magnetic field on the nonlinear optical rectification, second, and third-harmonic generations in GaAs/AlGaAs asymmetric triple quantum well**  
Tuzemen A. T., Al E. B., Dakhlaoui H., Ungan F.  
European Physical Journal Plus, vol.138, no.7, 2023 (SCI-Expanded)
- 12. Linear and nonlinear optical properties of CdSe/ZnTe core/shell nanostructures with screened**

### **modified Kratzer potential**

Jaouane M., El-Bakkari K., Al E. B., Sali A., Ungan F.

European Physical Journal Plus, vol.138, no.4, 2023 (SCI-Expanded)

13. **The nonlinear optical properties of "12-6" tuned GaAs/GaAlAs double quantum well under the external fields**  
Tuzemen A. T., Dakhlaoui H., Al E. B., Ungan F.  
European Physical Journal Plus, vol.138, no.2, 2023 (SCI-Expanded)
14. **Nonlinear optical properties of modified Möbius squared potential well: influence of electric and magnetic fields**  
Salman Durmuslar A., Dakhlaoui H., Al E. B., Ungan F.  
Philosophical Magazine, vol.103, no.21, pp.1980-1991, 2023 (SCI-Expanded)
15. **Theoretical investigation of nonlinear optical properties of Mathieu quantum well**  
Al E. B., Peter A. J., Mora-Ramos M. E., Ungan F.  
EUROPEAN PHYSICAL JOURNAL PLUS, vol.138, no.1, pp.49, 2023 (SCI-Expanded)
16. **Effects of the confinement potential parameters and optical intensity on the linear and nonlinear optical properties of spherical quantum dots**  
Edet C., Al E. B., Ungan F., Ali N., Ramli M., Asjad M.  
Results in Physics, vol.44, 2023 (SCI-Expanded)
17. **Energy spectrum and interlevel transitions within the conduction band of a  $D_{2^+}$  complex confined in a spherical quantum dot**  
Al E. B., Sari H., Sakiroglu S., Sökmen I.  
OPTICAL AND QUANTUM ELECTRONICS, vol.54, no.12, pp.860, 2022 (SCI-Expanded)
18. **Photoionization cross section of a  $D_{2^+}$  complex in quantum dots: the role of donor atoms configuration**  
Al E. B., Sari H., Kasapoglu E., Sakiroglu S., Sökmen I.  
EUROPEAN PHYSICAL JOURNAL PLUS, vol.137, no.8, 2022 (SCI-Expanded)
19. **Effects of Applied Magnetic Field on the Optical Properties and Binding Energies Spherical GaAs Quantum Dot with Donor Impurity**  
Edet C. O., Al E. B., Ungan F., Ali N., Rusli N., Aljunid S. A., Endut R., Asjad M.  
NANOMATERIALS, vol.12, no.16, pp.2741, 2022 (SCI-Expanded)
20. **Shallow-donor impurity effects on the far infrared electron–electron optical absorption coefficient in single and core/shell spherical quantum dots with Konwent-like confinement potential**  
Al E. B., Kasapoglu E., Sari H., Sökmen I., Duque C. A.  
Optical and Quantum Electronics, vol.54, no.6, 2022 (SCI-Expanded)
21. **Dynamics of nonlinear optical rectification, second, and third harmonic generation in asymmetric triangular double quantum wells due to static electric and magnetic fields**  
Al E. B., Kasapoglu E., Ungan F.  
EUROPEAN PHYSICAL JOURNAL PLUS, vol.137, no.4, 2022 (SCI-Expanded)
22. **Electronic and optical properties of a  $D_{2^+}$  complex in two-dimensional quantum dots with Gaussian confinement potential**  
Sari H., Al E. B., Kasapoglu E., Sakiroglu S., Sökmen I., Toro-Escobar M., Duque C. A.  
EUROPEAN PHYSICAL JOURNAL PLUS, vol.137, no.4, 2022 (SCI-Expanded)
23. **Effect of magnetic field, size and donor position on the absorption coefficients related a donor within the core/shell/shell quantum dot**  
Al E. B.  
OPTICAL AND QUANTUM ELECTRONICS, vol.53, no.12, 2021 (SCI-Expanded)
24. **Influence of position dependent effective mass on impurity binding energy and absorption in quantum wells with the Konwent potential**  
Al E. B., Kasapoğlu E., Şakiroğlu S., Sari H., Sökmen İ.  
Materials Science in Semiconductor Processing, vol.135, 2021 (SCI-Expanded)
25. **Optical properties of spherical quantum dot in the presence of donor impurity under the magnetic**

field

Al E. B., Kasapoğlu E., Sari H., Sökmen I.

Physica B: Condensed Matter, vol.613, 2021 (SCI-Expanded)

26. **Zeeman splitting, Zeeman transitions and optical absorption of an electron confined in spherical quantum dots under the magnetic field**  
Al E. B., Kasapoğlu E., Sari H., Sökmen I.  
PHILOSOPHICAL MAGAZINE, vol.101, no.1, pp.117-128, 2021 (SCI-Expanded)
27. **Binding energies and optical absorption of donor impurities in spherical quantum dot under applied magnetic field**  
Al E. B., Kasapoğlu E., Sakiroglu S., Sari H., Sökmen I., Duque C.  
Physica E: Low-Dimensional Systems and Nanostructures, vol.119, 2020 (SCI-Expanded)
28. **Binding energy of donor impurity states and optical absorption in the Tietz-Hua quantum well under an applied electric field**  
Al E. B., Kasapoglu E., Sakiroglu S., Duque C. A., Sokmen I.  
JOURNAL OF MOLECULAR STRUCTURE, vol.1157, pp.288-291, 2018 (SCI-Expanded)
29. **Effects of magnetic field, hydrostatic pressure and temperature on the nonlinear optical properties in symmetric double semi-V-shaped quantum well**  
Yesilgul U., Ungan F., Al E. B., Kasapoglu E., Sari H., Sokmen I.  
OPTICAL AND QUANTUM ELECTRONICS, vol.48, no.12, 2016 (SCI-Expanded)
30. **Infrared transitions between hydrogenic states in GaInNAs/GaAs quantum wells**  
Al E. B., Ungan F., Yesilgul U., Kasapoglu E., Sari H., Sokmen I.  
INTERNATIONAL JOURNAL OF MODERN PHYSICS B, vol.30, no.22, 2016 (SCI-Expanded)
31. **Linear and nonlinear optical properties in an asymmetric double quantum well under intense laser field: Effects of applied electric and magnetic fields**  
Yesilgul U., Al E. B., Martinez-Orozco J. C., Restrepo R. L., Mora-Ramos M. E., Duque C. A., Ungan F., Kasapoglu E.  
OPTICAL MATERIALS, vol.58, pp.107-112, 2016 (SCI-Expanded)
32. **Effects of applied electric and magnetic fields on the nonlinear optical properties of asymmetric GaAs/Ga<sub>1-x</sub>Al<sub>x</sub>As double inverse parabolic quantum well**  
Al E. B., Ungan F., Yesilgul U., Kasapoglu E., Sari H., Sokmen I.  
OPTICAL MATERIALS, vol.47, pp.1-6, 2015 (SCI-Expanded)

## Articles Published in Other Journals

1. **The Nonlinear Optical Properties of Self-Assembled InAs/GaAs Quantum Dot: Effect of Hydrostatic Pressure and Temperature**  
Jaouane M., El-Bakkari K., AL E. B., Sali A., UNGAN F.  
CUMHURİYET SCIENCE JOURNAL, vol.45, pp.386-393, 2024 (Peer-Reviewed Journal)
2. **Effect of size modulation and donor position on intersubbands refractive index changes of a donor within a spherical core/shell/shell semiconductor quantum dot**  
Al E. B.  
Cumhuriyet Science Journal, vol.42, no.3, pp.694-701, 2021 (Peer-Reviewed Journal)
3. **Nonlinear optical rectification the second and third harmonic generation in asymmetric double quantum well under the intense laser field**  
Yeşilgül Ü., Al E. B., Ungan F., Kasapoğlu E.  
Cumhuriyet Science Journal, vol.37, no.4, 2016 (Peer-Reviewed Journal)
4. **SAFSIZLIK DÜZEYLERİ ARASINDAKİ KIZILÖTESİ GEÇİŞLER ÜZERİNE ELEKTRİK ALAN ETKİSİ**  
Al E. B., Yıldız Y. E., Ungan F.  
Cumhuriyet Science Journal, vol.36, no.7, pp.153-173, 2015 (Peer-Reviewed Journal)

## Books & Book Chapters

### 1. **Mekanik Laboratuvarı**

Al E. B., Kasapoğlu E.

Cumhuriyet Üniversitesi Yayınları, Sivas, 2016

## Refereed Congress / Symposium Publications in Proceedings

### 1. **EFFECT OF MAGNETIC FIELD ON LINEAR AND NONLINEAR REFRACTIVE INDEX CHANGES OF A SINGLE DONOR IN A SPHERICAL CORE/SHELL/SHELL SEMICONDUCTOR QUANTUM DOT**

Al E. B.

3. INTERNATIONAL BAKU SCIENTIFIC RESEARCH CONGRESS, Baku, Azerbaijan, 15 - 16 October 2021, pp.904-916

### 2. **EFFECT OF SIZE MODULATION ON THE OPTICAL PROPERTIES OF THE ELECTRON IN A SPHERICAL CORE/SHELL/SHELL SEMICONDUCTOR QUANTUM DOT**

Al E. B.

2.INTERNATIONAL SCIENTIFIC RESEARCH AND INNOVATION CONGRESS, İstanbul, Turkey, 11 - 12 September 2021, pp.621-632

### 3. **OPTICAL PROPERTIES OF INFINITE SPHERICAL QUANTUM DOT UNDER MAGNETIC FIELD**

Al E. B., Kasapoğlu E., Sari H.

VIII. UMTEB INTERNATIONAL CONGRESS ON VOCATIONAL TECHNICAL SCIENCES, Sivas, Turkey, 11 - 13 October 2019, pp.234-244

### 4. **OPTICAL PROPERTIES OF FINITE SPHERICAL QUANTUM DOT UNDER MAGNETIC FIELD**

Al E. B., Kasapoğlu E., Sari H.

VIII. UMTEB INTERNATIONAL CONGRESS ON VOCATIONAL TECHNICAL SCIENCES, Sivas, Turkey, 11 - 13 October 2019, pp.223-233

### 5. **Binding Energy Of Donor Impurity States And Optical Absorption In Tietz-Hua Quantum Well Under The Electric Field**

Al E. B., Kasapoğlu E., Duque C. A., Şakiroğlu S., Sökmen İ.

4th International conference on materials science and nanotechnology for next generation (MSNG2017), Sarajevo, Bosnia And Herzegovina, 28 - 30 June 2017, pp.94

### 6. **NONLINEAR OPTICAL RECTIFICATION THE SECOND AND THIRD HARMONIC GENERATION IN AN ASYMMETRIC DOUBLE QUANTUM WELL UNDER THE INTENSE LASER FIELD**

Al E. B., Yeşilgöl Ü., Ugan F., Kasapoğlu E.

16th International Balkan Workshop on Applied Physics and Materials Science, Constanta, Romania, 7 - 09 July 2016, pp.86-87

### 7. **The effect of electric field on the nonlinear optical properties in asymmetric parabolic quantum well under intense laser field**

Yeşilgöl Ü., Ugan F., Al E. B., Kasapoğlu E.

The 16 th International Balkan Workshop on Applied Physics, Constanta, Romania, 7 - 09 July 2016

## Academic and Administrative Experience

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	<b>Vocational School</b>	
2024 - Continues	<b>Management Board Member</b>	Sivas Cumhuriyet University, Koyulhisar Meslek Yüksekokulu
2024 - Continues	<b>Deputy Head of Department</b>	Sivas Cumhuriyet University, Fen Fakültesi, Fizik Bölümü

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## Courses

Genel Fizik II, Undergraduate, 2023 - 2024, 2022 - 2023  
Mesleki İngilizce II, Undergraduate, 2023 - 2024, 2022 - 2023  
Graduation Thesis, Undergraduate, 2023 - 2024, 2022 - 2023  
Bilim Tarihi, Undergraduate, 2023 - 2024  
Optik İnce Film Kaplama Teknikleri, Postgraduate, 2023 - 2024  
General Physics I, Undergraduate, 2023 - 2024, 2022 - 2023  
Physics, Undergraduate, 2023 - 2024, 2022 - 2023  
Mesleki İngilizce I, Undergraduate, 2023 - 2024  
Medical Physics, Undergraduate, 2022 - 2023  
General Physics Laboratory - I, Undergraduate, 2022 - 2023  
General Physics II, Undergraduate, 2020 - 2021  
General Physics Laboratory II, Undergraduate, 2020 - 2021  
Vocational English I, Undergraduate, 2021 - 2022  
General Physics Laboratory I, Undergraduate, 2020 - 2021  
General Physics I, Undergraduate, 2020 - 2021

## Activities in Scientific Journals

American Journal of Nano Research and Applications, Committee Member, 2022 - Continues

## Scientific Refereeing

OPTICAL AND QUANTUM ELECTRONICS, SCI Journal, August 2023  
OPTICAL AND QUANTUM ELECTRONICS, SCI Journal, July 2023  
PHILOSOPHICAL MAGAZINE, SCI Journal, July 2023  
PHILOSOPHICAL MAGAZINE, SCI Journal, June 2023  
OPTICAL AND QUANTUM ELECTRONICS, SCI Journal, May 2023  
PHILOSOPHICAL MAGAZINE, SCI Journal, March 2023  
PHYSICA SCRIPTA, SCI Journal, March 2023  
PHILOSOPHICAL MAGAZINE, SCI Journal, March 2023  
PHYSICA SCRIPTA, SCI Journal, February 2023  
PHILOSOPHICAL MAGAZINE, Journal Indexed in SCI-E, December 2022  
PHYSICA SCRIPTA, Journal Indexed in SCI-E, October 2022  
PHYSICA SCRIPTA, Journal Indexed in SCI-E, August 2022  
PHYSICA SCRIPTA, Journal Indexed in SCI-E, July 2022  
INDIAN JOURNAL OF PHYSICS, Journal Indexed in SCI-E, June 2022  
Journal Of Low Temperature Physics, Journal Indexed in SCI-E, June 2022  
PHYSICA SCRIPTA, Journal Indexed in SCI-E, April 2022  
Physica Scripta, Journal Indexed in SCI-E, March 2022  
Cumhuriyet Science Journal, Other Indexed Journal, January 2022  
Physica Scripta, Journal Indexed in SCI-E, November 2020

## Metrics

Publication: 44

Citation (WoS): 163

Citation (Scopus): 394

H-Index (WoS): 7

H-Index (Scopus): 10

## Congress and Symposium Activities

5th International Conference on Physical Chemistry & Functional Materials, Working Group, Sivas, Turkey, 2022

9th International Workshop on Nuclear Structure Properties, Working Group, Sivas, Turkey, 2016

## Research Areas

Electrical properties of electronic structures, interfaces, thin films and low-dimensional structures, Magnetic Properties and Materials, Optical Properties, Spectroscopy of Matter

## Non Academic Experience

Club, ÜLKÜ SPOR GENÇLİK KULÜBÜ DERNEĞİ, Spor