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VIJEĆU UNIVERZITETA U SARAJEVU - PRIRODNO-MATEMATIČKI FAKULTET

Predmet: Izbor nastavnika u zvanje redovnog profesora za oblast "Teorijska fizika" na Odsjeku za fiziku

Odlukom Vijeća Univerziteta u Sarajevu – Prirodno-matematički fakultet (br. 01/06-1642/2-2022), donešenoj na elektronskoj 42. sjednici koja je održana 04.07.2022. godine, imenovana je komisija za pripremanje prijedloga za izbor nastavnika u zvanje redovnog profesora za oblast: "Teorijska fizika", jedan izvršilac sa punim radnim vremenom, u sastavu:

Dr. Dejan Milošević, akademik, redovni profesor Univerziteta u Sarajevu – Prirodno-matematički fakultet, uža naučna oblast: „Teorijska fizika“, predsjednik;

Dr. Hrvoje Buljan, redoviti profesor u trajnom zvanju na Zavodu za teorijsku fiziku, Fizički odsjek, Prirodoslovno-matematički fakultet Sveučilišta u Zagrebu, uža naučna oblast: „Teorijska fizika“, član;

Dr. Krešimir Kumerički, redoviti profesor na Zavodu za teorijsku fiziku čestica i polja, Fizički odsjek, Prirodoslovno-matematički fakultet Sveučilišta u Zagrebu, uža naučna oblast: „Teorijska fizika polja i čestica“, član.

Na konkurs objavljen 27.05.2022. godine u u dnevnom listu "Dnevni avaz", na web - stranici Fakulteta i na web - stranici Univerziteta u Sarajevu, kao jedini kandidat prijavila se dr. Azra Gazibegović-Busuladžić, vanredna profesorica na Univerzitetu u Sarajevu - Prirodno-matematički fakultet, Odsjek za fiziku. Nakon uvida u priloženu dokumentaciju Komisija podnosi slijedeći

IZVJEŠTAJ

BIOGRAFSKI PODACI KANDIDATKINJE

Azra Gazibegović-Busuladžić je rođena u Sarajevu 1976. godine. Drugu gimnaziju je završila 1994. godine u Sarajevu, a diplomirala na Odsjeku za fiziku Prirodno-matematičkog fakulteta u Sarajevu 1998. godine sa prosječnom ocjenom studija 9,6. Od 1998 do 2000. godine predavala je fiziku u Drugoj gimnaziji u Sarajevu. Na Odsjeku za fiziku Prirodno-matematičkog fakulteta u Sarajevu je primljena za asistenta u decembru 1999. godine. U zvanje višeg asistenta izabrana je u novembru 2005. godine, u zvanje docenta u februaru 2011. godine, a u zvanje vanrednog profesora u decembru 2016. godine (svi izbori su za oblast „Teorijska fizika“).

Intenzivnijim naučnoistraživačkim radom počela se baviti 2001. godine. Tada upisuje postdiplomski studij na Odsjeku za fiziku Prirodno-matematičkog fakulteta Univerziteta u Tuzli, gdje je magistrirala u junu 2005. godine. Tema magistarskog rada je bila "Odvajanje elektrona od negativnih jona u jakom laserskom polju". Postaje članom naučnoistraživačke grupe Samophys pod vođstvom akademika prof. dr. Dejana Miloševića. Kao član Grupe učestvovala je u više domaćih i međunarodnih naučnoistraživačkih projekata, a bila je i voditelj dva domaća projekta. U okviru tih projekata ostvarena je saradnja sa nekoliko eksperimentalnih i teorijskih naučnoistraživačkih grupa iz Sjedinjenih Američkih Država, Japana, Velike Britanije, Njemačke i Nizozemske.

Doktorirala je na Prirodno-matematičkom fakultetu Univerziteta u Sarajevu 14.07.2010. godine na temu "Negativni joni u jakom laserskom polju – simulacija eksperimenata". Prema Web of Science bazi podataka do sada je objavila 41 rad koji su citirani 952 puta. Odgovarajući h indeks pomenutih

radova je 16. Koautor je udžbenika “Praktikum iz Elektromagnetizma”, “Fizika I sa primjenama u biologiji i medicini”, „Fizika II sa primjenama u biologiji i medicini“, i „Zbirka zadataka iz Fizike sa primjenama u biologiji i medicini“. U periodu od 2012. godine do 2016. godine obavljala je dužnost zamjenice šefa Odsjeka za fiziku, a od 2016. godine do 2020. godine bila je šef Odsjeka za fiziku. Od 2020. godine je voditeljica Vijeća III ciklusa – doktorskog studija fizičkih nauka. Trenutno je u zvanju vanredne profesorice.

Tečno govori engleski jezik. Koristi se programskim jezicima i paketima: FORTRAN, C, Mathematica, MATLAB, Octave, LaTeX, R.

NAUČNI RADOVI I NAUČNOISTRAŽIVAČKA AKTIVNOST PRIJE IZBORA U ZVANJE VANREDNOG PROFESORA

Magistarski rad

Azra Gazibegović-Busuladžić, “Odvajanje elektrona od negativnih jona u jakom laserskom polju”, Magistarski rad, JU Univerzitet u Tuzli, Prirodno-matematički fakultet, 2005.

Doktorska disertacija

Azra Gazibegović-Busuladžić, “Negativni joni u jakom laserskom polju – simulacija eksperimenta”, Doktorska disertacija, Prirodno-matematički fakultet, Univerzitet u Sarajevu, 2010.

Radovi registrirani u Web of Science Core Collection i Scopus bazama podataka

1. D. B. Milošević, A. Gazibegović-Busuladžić, and W. Becker: *Direct and rescattered electrons in above-threshold detachment from negative ions*, Phys. Rev. A: General Physics **68**, 050702(R), 1-4 (2003).
2. A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker: *High-energy above-threshold detachment from negative ions*, Phys. Rev. A: General Physics **70**, 053403, 1-14 (2004).
3. Frank Pillon, Hervé Gilles, Sylvain Girard, Mathieu Laroche, Robin Kaiser, and Azra Gazibegović: *Goos-Hänchen and Imbert-Fedorov shifts for leaky guided modes*, Journal of the Optical Society of America B **22**, 1290-1299 (2005).
4. M. Busuladžić, A. Gazibegović-Busuladžić, and D. B. Milošević: *High-order above-threshold ionization in a laser field: Influence of ionization potential on high-energy cutoff*, Laser Phys. **16** (2), 289-293 (2006).
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6. A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker, *Gauge dependence of the strong-field approximation: Theory vs. experiment for photodetachment of F⁻*, Optics Communications **275**, 116-122 (2007).
7. E. Hasović, M. Busuladžić, A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker: *Simulation of the above-threshold ionization experiments using strong-field approximation*, Laser Phys. **17** (4), 376-389 (2007).
8. D. B. Milošević, E. Hasović, M. Busuladžić, A. Gazibegović-Busuladžić, and W. Becker: *Intensity-dependent enhancements in high-order above-threshold ionization*, Phys. Rev. A **76** (5), 053410, 1-16 (2007).
9. M. Busuladžić, A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker: *Angle-resolved high-order above-threshold ionization of a molecule: Sensitive tool for molecular characterization*, Phys. Rev. Lett. **100** (20), 203003, 1-4 (2008).
10. M. Busuladžić, A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker: *Strong-field approximation for ionization of a diatomic molecule by a strong laser field: II. The role of electron rescattering off the molecular centers*, Phys. Rev. A **78** (3), 033412, 1-11 (2008).

11. D. B. Milošević, E. Hasović, S. Odžak, M. Busuladžić, A. Gazibegović-Busuladžić, and W. Becker: *Wavelength dependence of channel-closing enhancements in high-order above-threshold ionization and harmonic generation*, J. Mod. Opt. **55** (16), 2653-2663 (2008).
12. M. Okunishi, R. Itaya, K. Shimada, G. Prümper, K. Ueda, M. Busuladžić, A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker: *Angle-resolved high-order above-threshold ionization spectra for N₂ and O₂: measurements and strong-field approximation*, J. Phys. B **41** (20), 201004 (FTC), 1-5 (2008).
13. D. B. Milošević, E. Hasović, S. Odžak, M. Busuladžić, A. Gazibegović-Busuladžić, and W. Becker: *New results in above-threshold ionization and high-harmonic generation of atomic and molecular systems*, Laser Phys. **19** (2), 185-190 (2009).
14. M. Okunishi, R. Itaya, K. Shimada, G. Prümper, K. Ueda, M. Busuladžić, A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker: *Two-source double-slit interference in angle-resolved high-energy above-threshold ionization spectra of diatoms*, Phys. Rev. Lett. **103** (4), 043001 (2009).
15. M. Busuladžić, A. Gazibegović-Busuladžić, and D. B. Milošević: *Strong-field approximation for ionization of a diatomic molecule by a strong laser field: III. High-order above-threshold ionization by an elliptically polarized field*, Phys. Rev. A **80** (1), 013420, 1-8 (2009).
16. M. Busuladžić, A. Gazibegović-Busuladžić, E. Hasović, D. B. Milošević, and W. Becker: *Atoms and molecules in a strong laser field*, Acta Phys. Pol. A **116** (4), 516-518 (2009).
17. D. B. Milošević, M. Busuladžić, A. Gazibegović-Busuladžić, and W. Becker: *Strong-field approximation for high-order above-threshold ionization of randomly oriented diatomic molecules*, Chem. Phys. **366** (1-3), 85-90 (2009).
18. M. Busuladžić, A. Gazibegović-Busuladžić, and D. B. Milošević: *Ellipticity Dependence of High- Order Above – Threshold Ionization from Aligned Diatomic Molecules*, Laser Phys. **20** (5), 1-8 (2010).
19. A. Gazibegović-Busuladžić, D. B. Milošević, W. Becker, B. Bergues, H. Hultgren, and I. Yu. Kiyan: *Electron rescattering in above-threshold photodetachment of negative ions*, Phys. Rev. Lett. **100** (20), 203003 (2010).
20. A. Gazibegović-Busuladžić, E. Hasović, M. Busuladžić, D. B. Milošević, F. Kelkensberg, W. K. Siu, M. J. J. Vrakking, F. Lépine, G. Sansone, M. Nisoli, I. Znakovskaya, and M. F. Kling: *Above-threshold ionization of diatomic molecules by few-cycle laser pulses*, Phys. Rev. A **84** (4), 043426, 1-8 (2011).
21. A. Čerkić, M. Busuladžić, E. Hasović, A. Gazibegović-Busuladžić, W. Becker and D. B. Milošević and: *Plateau structures in laser-assisted and laser induced processes*, Phys. Scr. **T149**, 014403, 1-4 (2012).
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23. E. Hasović, A. Gazibegović-Busuladžić, M. Busuladžić, D. B. Milošević and W. Becker: *High-order above-threshold ionization with few-cycle laser pulses: Molecular improved strong-field approximation vs. molecular low- frequency approximation*, Laser Phys. **22** (12), 1819-1826 (2012).
24. E. Hasović, D. B. Milošević, M. Busuladžić, A. Gazibegović-Busuladžić and W. Becker: *High-order above-threshold ionization of heteronuclear diatomic molecules by a strong laser field with arbitrary polarization*, Laser Phys. **22** (12), 1827-1832 (2012).
25. M. Busuladžić, A. Gazibegović-Busuladžić, W. Becker, and D. B. Milošević, *Molecular above-threshold ionization with a circularly polarized laser field*, Eur. Phys. J. D **67** (3), 61, 1-13 (2013).
26. M. Busuladžić, A. Čerkić, S. Odžak, A. Gazibegović-Busuladžić, E. Hasović, D. Habibović, and D. B. Milošević: *Atomic and molecular processes generated by linearly polarized few-cycle laser pulses*, Phys. Scr. **T162**, 014008, 1-5 (2014).
27. S. Odžak, A. Čerkić, M. Busuladžić, E. Hasović, A. Gazibegović-Busuladžić, and D. B. Milošević: *Heteronuclear diatomic molecules in a strong laser field with an arbitrary polarization*, Phys. Scr. **T162**, 014012, 1-5 (2014).

28. V. Mešić, Dž. Dervić, A. Gazibegović-Busuladžić, Dž. Salibašić, and Nataša Erceg: *Comparing the Impact of Dynamic and Static Media on Students' Learning of One-Dimensional Kinematics*, Eurasia Journal of Mathematics, Science & Technology Education **11** (5), 1119-1140 (2015).
29. E. Hasović, D. B. Milošević, A. Gazibegović-Busuladžić, A. Čerkić, and M. Busuladžić: *Molecular above-threshold ionization spectra as an evidence of the three-point interference of electron wave packets*, J. Phys.: Conf. Ser. **594** (1): 012056, 1-9 (2015).
30. D. Habibović, S. Odžak, M. Busuladžić, E. Hasović, A. Gazibegović-Busuladžić, A. Čerkić and D. B. Milošević: *Interference structure in nonlinear processes in strong infrared laser fields*, Opt. Quant. Electron. **48** (3): 192, 1-7 (2016).
31. S. Odžak, E. Hasović, A. Kramo, M. Busuladžić, A. Gazibegović-Busuladžić, A. Čerkić, B. Fetić, and D. B. Milošević: *Atomic processes in strong bichromatic elliptically polarized laser fields*, AIP Conference Proceedings **1722**, 200007, 1-5 (2016).

Radovi u međunarodnim časopisima registriranim u drugim bazama podataka

1. A. Gazibegović-Busuladžić, E. Hasović, S. Odžak, M. Busuladžić, D. B. Milošević: *High-order above-threshold ionization and high-order harmonic generation of molecule: a way of its characterization*, Bulletin of the Chemists and Technologists of Bosnia and Herzegovina **38**, 5-12 (2012).
2. S. Odžak, A. Čerkić, A. Gazibegović-Busuladžić, E. Hasović, M. Busuladžić, D. B. Milošević: *Laser-induced Processes of Diatomic Molecules: Homonuclear vs. Heteronuclear Species*, Bulletin of the Chemists and Technologists of Bosnia and Herzegovina **41**, 20-28 (2013).
3. Edis Đedović, Azra Gazibegović-Busuladžić, Adnan Beganović: *Fractal Analysis of Digital Mammograms*, Folia Med. Fac. Med. Univ. Saraeviensis, **50**(1): 55-58 (2015).

Radovi na međunarodnim naučnim konferencijama

1. R. Kaiser, A. Gazibegović, Y. Lévy, J. Fleming, S. Muniz, Ph. Courteille, L. Marcassa, and V. Bagnato: *Resonant Goos-Haenchen shift: a phase sensitive detection*, "Couches Minces Optiques", Pôle Optique et Photonique Sud en partenariat avec l'Institut Fresnel, Marseille, France, 14 Juin (2001).
2. D. B. Milošević, A. Gazibegović-Busuladžić, and W. Becker, *High-energy plateau in excess-photon detachment of electrons from negative ions*, 12th International Laser Physics Workshop (LPHYS'03), Hamburg, Germany, August 25-29, 2003, Book of Abstracts, P2.10, p.162 (2003).
3. A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker, *High-order above-threshold detachment from halogen negative ions*, poster, 10th International Conference on Multiphoton Processes (ICOMP 10), Orford, Quebec, Canada, October 9-14 (2005).
4. D. B. Milošević, E. Hasović, M. Busuladžić, A. Gazibegović-Busuladžić, A. Čerkić, and W. Becker: *Simulation of the above-threshold ionization and detachment experiments using strong-filed approximation*, 15th International Laser Physics Workshop (LPHYS'06), Lausanne, Switzerland, July 24-28, 2.7.1, p. 107 (2006).
5. A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker, *Above threshold detachment from F- and Br-: a simulation of the experiment*, 15th International Laser Physics Workshop (LPHYS'06), Lausanne, Switzerland, July 24-28, 2.4., p. 143 (2006).
6. D. B. Milošević, E. Hasović, M. Busuladžić, A. Gazibegović-Busuladžić, and W. Becker: *Enhancements in high-order above-threshold ionization*, Time-Dependent Phenomena in Quantum Mechanics, Blaubeuren, Germany, September 12-16 (2007).
7. D. B. Milošević, E. Hasović, M. Busuladžić, A. Gazibegović-Busuladžić, and W. Becker: *High-order above-threshold ionization of atoms and molecules*, Novel Light Sources and Applications, Obergurgl, Austria, February 3-9 (2008).
8. M. Busuladžić, A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker: *High-energy above-threshold ionization spectra of diatomic molecules in a strong laser field: N₂ (σ_g symmetry) vs. O₂ (π_g symmetry)*, Novel Light Sources and Applications, Obergurgl, Austria, February 3-9 (2008).

9. D. B. Milošević, M. Busuladžić, A. Gazibegović-Busuladžić, and W. Becker: *Angle-resolved high-order above-threshold ionization of a molecule: Sensitive tool for molecular characterization*, Gordon Research Conference on Multiphoton Processes, Tilton School, Tilton, NH, USA, June 8-13 (2008).
10. A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker: "Saturation effects in HATI: electron spectra dependence on the temporal pulse shape", Laser Physics Workshop (LPHYS'08), Trondheim, Norway, June 30-July 4, p.157 (2008).
11. D. B. Milošević, E. Hasović, S. Odžak, M. Busuladžić, A. Gazibegović-Busuladžić, and W. Becker: *New results in above-threshold ionization and high-harmonic generation of atomic and molecular systems*, Laser Physics Workshop (LPHYS'08), Trondheim, Norway, June 30 – July 4, p. 109 (2008).
12. M. Busuladžić, A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker: *Ionization of diatomic molecules by strong laser field with linear or elliptical polarization*, Laser Physics Workshop (LPHYS'08), Trondheim, Norway, June 30 – July 4, p. 156 (2008).
13. M. Okunishi, R. Itaya, K. Shimada, G. Prümper, K. Ueda, M. Busuladžić, A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker: *Angle-resolved high-order above-threshold ionization (ATI) spectra for N₂ and O₂: Measurements and strong-field approximation simulations*, 11th International Conference on Multiphoton Processes (ICOMP'08), Heidelberg, Germany, September 18-23, Mo62 (2008).
14. M. Okunishi, R. Itaya, K. Shimada, G. Prümper, K. Ueda, M. Busuladžić, A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker: *Two-source double-slit interference in angle-resolved high-energy above-threshold ionization spectra of diatoms*, 25th Symposium on Chemical Kinetics and Dynamics, Omiya Sonic City, Omiya, Japan, June 1-3, 3A08 (2009).
15. M. Okunishi, R. Itaya, K. Shimada, G. Prümper, K. Ueda, T. Morishita, Z. Chen, S. Watanabe, C. D. Lin, M. Busuladžić, A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker : *Angle-resolved high-energy ATI spectra of rare gas and diatomic molecules*, Symposium on Dynamics of Molecules and Clusters, Department of Chemistry, Graduate School of Science, Tohoku University, Japan, June 3 (2009).
16. M. Busuladžić, A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker: *Ellipticity dependence of high-order above-threshold ionization from aligned diatomic molecules*, Laser Physics Workshop (LPHYS'09), Barcelona, Spain, July 13-17, p. 108 (2009).
17. M. Okunishi, R. Itaya, K. Shimada, G. Prümper, K. Ueda, M. Busuladžić, A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker: *Two-source double-slit interference in angle-resolved high-energy above-threshold ionization spectra of diatoms*, Laser Physics Workshop (LPHYS'09), Barcelona, Spain, July 13-17, p. 132 (2009).
18. M. Okunishi, R. Itaya, K. Shimada, G. Prümper, K. Ueda, M. Busuladžić, A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker: *Two-source double-slit interference in angle-resolved high-energy above-threshold ionization spectra of diatoms*, XXVI International Conference on Photonic, Electronic, and Atomic Collisions, Western Michigan University, Kalamazoo, Michigan, USA, July 22-28, Fr183 (2009).
19. M. Okunishi, R. Itaya, K. Shimada, G. Prümper, K. Ueda, M. Busuladžić, A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker: *Two-source double-slit interference in angle-resolved high-energy above-threshold ionization spectra of diatoms*, Second International Conference on Attoscience Physics, Kansas State University, Manhattan, Kansas, USA, July 28 – August 1, F10 (2009).
20. M. Busuladžić, A. Gazibegović-Busuladžić, E. Hasović, D. B. Milošević, and W. Becker: *Atoms and molecules in a strong laser field*, II International School and Conference on Photonics, Belgrade, Serbia, August 24-28, p. 64 (2009).
21. M. Okunishi, R. Itaya, K. Shimada, G. Prümper, K. Ueda, M. Busuladžić, A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker: *Two-source double-slit interference in angle-resolved high-energy above-threshold ionization spectra of diatoms*, International Workshop on Electronic Spectroscopy for Gas-phase Molecules and Solid Surfaces, ICES 11 satellite workshop hosted by IMRAM, Tohoku University, October 12-15, p. 34 (2009).
22. A. Gazibegović-Busuladžić, D. B. Milošević, W. Becker, B. Bergues, I. Yu. Kiyan, and H. Helm: *High-order above-threshold photodetachment from halogen ions: plateau in the electron*

energy spectra caused by the rescattered electrons, Laser Physics Workshop (LPHYS'09), Barcelona, Spain, July 13-17, p.163 (2009).

23. Boris Bergues, Hannes Hultgren, Igor Kiyani, Azra Gazibegović-Busuladžić, Dejan Milošević, and Wilhelm Becker, *The Rescattering Effect in Strong-Field Photodetachment of Negative Ions*, 74. Jahrestagung und DPG Frühjahrstagung der Sektion AMOP, Hannover, Germany, 8.-12. March 2010.

24. H. Hultgren, I. Yu. Kiyani, B. Bergues, A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker, *Electron Rescattering in Above-Threshold Photodetachment of Negative Ions*, 10th European Conference on Atoms Molecules and Photons (ECAMP 10), Salamanca, Spain, 04 Jul 2010 - 09 Jul 2010.

25. E. Hasović, D. B. Milošević, M. Busuladžić, A. Gazibegović-Busuladžić, and W. Becker: *High-order above-threshold ionization of heteronuclear diatomic molecules by strong laser field with arbitrary polarization*, Laser Physics Workshop (LPHYS' 11), Sarajevo, Bosnia and Herzegovina, July 11-15, S2/p.30 (2011).

26. E. Hasović, A. Gazibegović-Busuladžić, M. Busuladžić, D. B. Milošević, and W. Becker: *High-order above-threshold ionization with few-cycle laser pulses: molecular improved strong-field approximation vs. molecular low-frequency approximation*, Laser Physics Workshop (LPHYS' 11), Sarajevo, Bosnia and Herzegovina, July 11-15, S2/p.33 (2011).

27. A. Čerkić, M. Busuladžić, E. Hasović, A. Gazibegović-Busuladžić, D. B. Milošević, and W. Becker: *Plateau structures in laser-assisted and laser induced processes*, III International School and Conference on Photonics, Belgrade, Serbia, August 29-September 02, p.91-92 (2011).

28. A. Čerkić, M. Busuladžić, E. Hasović, A. Gazibegović-Busuladžić, S. Odžak, and D. B. Milošević: *Ellipticity dependence of the plateau structures in different atomic and molecular processes in strong laser field*, III International School and Conference on Photonics, Belgrade, Serbia, August 29- September 02, p.92-93 (2011).

29. S. Odžak, A. Čerkić, M. Busuladžić, E. Hasović, A. Gazibegović-Busuladžić, and D. B. Milošević: *Heteronuclear diatomic molecules in a strong laser field with an arbitrary polarization*, IV International School and Conference on Photonics, Belgrade, Serbia, August 26-30, p.71 (2013).

30. M. Busuladžić, A. Čerkić, S. Odžak, A. Gazibegović-Busuladžić, E. Hasović, D. Habibović, and D. B. Milošević: *Atomic and molecular processes generated by linearly polarized few-cycle laser pulses*, IV International School and Conference on Photonics, Belgrade, Serbia, August 26-30, p.72 (2013).

31. A. Gazibegović-Busuladžić, E. Hasović, A. Čerkić, W. Becker, D. B. Milošević, and M. Busuladžić, *Atomic and molecular processes generated by few-cycle laser pulses*, 23rd International Laser Physics Workshop (LPHYS'14), Sofia, Bulgaria, July 14–18, p. 58 (2014).

32. D. Habibović, E. Hasović, A. Gazibegović-Busuladžić, S. Odžak, A. Čerkić, M. Busuladžić, and D. B. Milošević, *Laser – induced nonlinear processes in molecules*, Poster, The 1st Conference of Medical and Biological Engineering in Bosnia and Herzegovina (CMBEBiH 2015), Sarajevo, Bosnia and Herzegovina, March 13-15 (2015).

33. E. Đedović, A. Gazibegović-Busuladžić, and A. Beganović, *Fractal Analysis of Digital Mammograms*, Talk, The 1st Conference of Medical and Biological Engineering in Bosnia and Herzegovina (CMBEBiH 2015), Sarajevo, Bosnia and Herzegovina, March 13-15 (2015).

Naučnoistraživački projekti

1. “Control of Atomic Processes with Strong Fields”, projekat podržan od strane Volkswagen Foundation, Programme: "Cooperation with Natural and Engineering Scientists in Central and Eastern Europe", 2001./2005. (voditelj prof. dr. Dejan Milošević)

2. “Kontrola atomskih procesa u jakom laserskom polju”, projekat finansiran od Federalnog ministarstva obrazovanja, nauke, kulture i sporta, 2002./2003. (voditelj prof. dr. Dejan Milošević)

3. “Atomski i molekularni procesi u jakom laserskom polju”, projekat finansiran od Federalnog ministarstva obrazovanja i nauke, 2004. (voditelj prof. dr. Dejan Milošević)

4. "Jonizacija dvoatomskih molekula i generacija viših harmonika pomoću jakog laserskog polja", projekat podržan od Federalnog ministarstva obrazovanja i nauke, 2007./2008. (voditelj prof. dr. Dejan Milošević)
5. "Primjena jakih laserskih polja u atofizici i atohemiji", projekat podržan od Federalnog ministarstva obrazovanja i nauke, 2009. (voditelj prof. dr. Dejan Milošević)
6. "Towards a quantitative strong-field approximation and its application to attoscience", projekat podržan od strane Alexander von Humboldt fondacije, 2010./2012. (voditelj prof. dr. Dejan Milošević)
7. „Analiza spektara poliatomskih molekula“, projekat podržan od Federalnog ministarstva obrazovanja i nauke, voditeljica: doc. dr. Azra Gazibegović-Busuladžić (2013.–2014.)
8. "Rezonantna pojačanja u jonizacionim spektrima molekula", projekat podržan od Federalnog ministarstva obrazovanja i nauke, voditelj: doc. dr. Elvedin Hasović (2015.–2016.)
9. "Nelinearni atomski procesi u jakom bihromatskom laserskom polju", projekat podržan od Federalnog ministarstva obrazovanja i nauke, voditelj: prof. dr. Senad Odžak (2015.–2016.)

Organizacija međunarodnih kongresa i skupova

„20th International Laser Physics Workshop LPHYS'11“, član lokalnog organizacionog komiteta, juli 2011, Sarajevo, BiH.

UDŽBENICI I MONOGRAFIJE PRIJE IZBORA U ZVANJE VANREDNOG PROFESORA

N. Gabela, Z. Hadžibegović, A. Gazibegović-Busuladžić i L. Gabela, "Praktikum iz elektromagnetizma", Univerzitetski udžbenik, Prirodno-matematički fakultet, Sarajevo, 2008.

M. Busuladžić, A. Čerkić, A. Gazibegović-Busuladžić, E. Hasović, J. Stahov, „Fizika I sa primjenama u biologiji i medicini“, Prirodno-matematički fakultet Univerziteta u Sarajevu, Sarajevo, 2015.

PEDAGOŠKE AKTIVNOSTI PRIJE IZBORA U ZVANJE VANREDNOG PROFESORA

Kandidatkinja je od 1998 do 2000. godine predavala fiziku u Drugoj gimnaziji u Sarajevu. Na Odsjeku za fiziku Prirodno-matematičkog fakulteta u Sarajevu je primljena za asistenta 1999. godine. Prema potrebama Odsjeka za fiziku držala je vježbe iz 16 predmeta iz oblasti Teorijska fizika i Opća fizika. U zvanju docenta predavala je šest predmeta na I ciklusu i tri predmeta na II ciklusu studija na Odsjeku za fiziku. Bila mentor jednog završnog rada II ciklusa.

NAUČNI RADOVI I NAUČNOISTRAŽIVAČKA AKTIVNOST NAKON IZBORA U ZVANJE VANREDNOG PROFESORA

Radovi registrirani u Web of Science Core Collection (WoS) i Scopus bazama podataka

Radovi iz uže naučne oblasti „Teorijska fizika“

Radovi kandidatkinje su iz oblasti atomske, molekularne i optičke fizike i laserske fizike. Kandidatkinja teorijski analizira različite atomske i molekularne procese koji su indukovani ili asistirani jakim laserskim polje. Ovdje navodimo naslove i apstrakte radova koji su objavljeni nakon izbora kandidatkinje u zvanje vanredne profesorice.

1. M. Busuladžić, A. Gazibegović-Busuladžić, and D. B. Milošević: *Strong-field ionization of homonuclear diatomic molecules by a bicircular laser field: Rotational and reflection symmetries*, Phys. Rev. A **95** (3), 033411, 1-10 (2017) (WoS)

Abstract: We investigate above-threshold ionization (ATI) of homonuclear diatomic molecules by the so-called bicircular field using the improved molecular strong-field approximation. Bicircular field is a two-

color laser field having coplanar circularly polarized counter-rotating components of frequencies $r\omega$ and $s\omega$, with r and s integers. Our analysis includes the high-energy part of the corresponding spectra, i.e., high-order ATI (HATI). The obtained molecular (H)ATI spectra are more complicated than the corresponding atomic spectra. We have identified four symmetries which are satisfied in (H)ATI of homonuclear diatomic molecules. Two of these symmetries are general rotational symmetries valid both for direct and rescattered HATI electrons. The remaining two symmetries are reflection symmetries valid only for the direct ATI electrons. Analytical proof of these symmetries is also given. These symmetries are illustrated using numerical examples of HATI spectra of the N_2 molecule for various molecular orientations.

2. D. Habibović, A. Čerkić, M. Busuladžić, A. Gazibegović-Busuladžić, S. Odžak, E. Hasović, and D. B. Milošević: *Molecules in a bicircular strong laser field*, Opt. Quant. Electron. **50**: 214, 1-10 (2018) (WoS)

Abstract: Strong-field ionization of nonlinear planar triatomic molecules by a bicircular laser field is analyzed within the improved molecular strong-field approximation. Our calculations include additional interaction between the liberated electrons and atomic or ionic centers of the parent molecular ion. The used bicircular field consists of two counterrotating circularly polarized fields having angular frequencies $r\omega$ and $s\omega$, with integer r and s . In the case when the laser-field-polarization plane is parallel to the plane of the considered molecule (example of ozone molecule is analyzed), the corresponding photoelectron spectra are not rotationally symmetric. On the other hand, when these planes are mutually perpendicular, for the $(r\omega, s\omega) = (\omega, 3\omega)$ bicircular field, the electron spectra satisfy the corresponding rotational symmetries. Analyzing the obtained spectra and the corresponding symmetries, one can extract information about molecular orientation and structure. This technique may also be useful for more complex polyatomic molecules.

3. A. Gazibegović-Busuladžić, M. Busuladžić, E. Hasović, W. Becker, and D. B. Milošević: *Strong-field ionization of linear molecules by a bicircular laser field: Symmetry considerations*, Phys. Rev. A: General Physics **97** (4), 043432, 1-13 (2018) (WoS)

Abstract: Using the improved molecular strong-field approximation, we investigate (high-order) above-threshold ionization [(H)ATI] of various linear polyatomic molecules by a two-color laser field of frequencies $r\omega$ and $s\omega$ (with integer numbers r and s) having coplanar counter-rotating circularly polarized components (a so-called bicircular field). Reflection and rotational symmetries for molecules aligned in the laser-field polarization plane, analyzed for diatomic homonuclear molecules in Phys. Rev. A **95**, 033411 (2017), are now considered for diatomic heteronuclear molecules and symmetric and asymmetric linear triatomic molecules. There are additional rotational symmetries for (H)ATI spectra of symmetric linear molecules compared to (H)ATI spectra of the asymmetric ones. It is shown that these symmetries manifest themselves differently for $r+s$ odd and $r+s$ even. For example, HATI spectra for symmetric molecules with $r+s$ even obey inversion symmetry. For ATI spectra of linear molecules, reflection symmetry appears only for certain molecular orientation angles $\pm 90^\circ - jr180^\circ/(r+s)$ (j integer). For symmetric linear molecules, reflection symmetry appears also for the angles $-jr180^\circ/(r+s)$. For perpendicular orientation of molecules with respect to the laser-field polarization plane, the HATI spectra are very similar to those of the atomic targets, i.e., both spectra are characterized by the same type of the $(r+s)$ -fold symmetry.

4. A. Gazibegović-Busuladžić, W. Becker, and D. B. Milošević: *Helicity asymmetry in strong-field ionization of atoms by a bicircular laser field*, Optics Express **26** (10), 12684-12697 (2018) (WoS)

Abstract: Ionization of atoms by an intense bicircular laser field is considered, which consists of two coplanar corotating or counterrotating circularly polarized field components with frequencies that are integer multiples of a fundamental frequency. Emphasis is on the effect of a reversal of the helicities of the two field components on the photoelectron spectra. The velocity maps of the liberated electrons are calculated using the direct strong-field approximation (SFA) and its improved version (ISFA), which takes into account rescattering off the parent ion. Under the SFA all symmetries of the driving field are preserved in the velocity map while the ISFA violates certain reflection symmetries. This allows one to assess the significance of rescattering in actual data obtained from an experiment or a numerical simulation.

5. M. Busuladžić, A. Čerkić, A. Gazibegović-Busuladžić, E. Hasović, and D. B. Milošević: *Molecular-orientation-dependent interference and plateau structures in strong-field ionization of a diatomic molecule by a corotating bichromatic elliptically polarized laser field*, Phys. Rev. A: General Physics **98** (1), 013413, 1-8 (2018) (WoS)

Abstract: We investigate strong-field ionization of homonuclear diatomic molecules, exemplified with the N_2 molecule, by a bichromatic elliptically polarized laser field having corotating components. We assume that both the emitted electron momentum vector and the internuclear vector of the diatomic molecule lay in

the laser-field polarization plane. Our analysis of the low-energy electron spectra caused by the direct above-threshold ionization (ATI) and of the high-energy rescattered electron spectra that can form an extended plateau (high-order ATI or HATI) is based on the improved molecular strong-field approximation. The photoelectron spectra obtained by (H)ATI of molecular targets are more complex and have a richer structure in comparison to the analogous spectra for atomic targets. We explain the observed interference structures by the interference of two electron wave packets emitted from the two centers of the diatomic molecule. Particular attention is devoted to the HATI spectra. For small values of the ellipticity the photoelectron spectra exhibit a plateau whose length can be as high as $17U_p$, with U_p the electron ponderomotive energy. The yield of high-energy electrons emitted nearly antiparallel to the semimajor axis of the laser-field polarization ellipse is one order of magnitude higher for perpendicular than for the parallel molecular orientation.

6. A. Gazibegović-Busuladžić, M. Busuladžić, A. Čerkić, E. Hasović, W. Becker, and D. B. Milošević: *Strong-Field Ionization of Linear Molecules by a Bichromatic Elliptically Polarized Laser Field with Coplanar Counterrotating or Corotating Components of Different Frequencies*, Journal of Physics: Conf. Series **1206**, 012003, 1-11 (2019) (Scopus)

Abstract. We investigate strong-field ionization of linear molecules by a two-color laser field of frequencies $r\omega$ and $s\omega$ having coplanar counterrotating or corotating elliptically polarized components (ω is the fundamental laser field frequency and r and s are integers). Using the improved molecular strong-field approximation we analyze direct above-threshold ionization (ATI) and high-order ATI (HATI) spectra. More precisely, reflection and rotational symmetries of these spectra for linear molecules aligned in the laser-field polarization plane are considered. The reflection symmetries for particular molecular orientations, known to be valid for a bicircular field (this is the field with circularly polarized counterrotating components), are valid also for arbitrary component ellipticities. However, specific rotational symmetries that are satisfied for HATI by a bicircular field, are violated for an arbitrary elliptically polarized field with counterrotating components. For the corotating case and the N_2 molecule we analyze molecular orientation-dependent interferences and plateau structures for various ellipticities.

7. A. Gazibegović-Busuladžić, D. Habibović, M. Busuladžić, and D. B. Milošević: *Molecular strong-field approximation for photodetachment of electrons from homonuclear diatomic molecular anions*, J. Opt. Soc. Am. B **37** (3), 813-819 (2020) (WoS)

Abstract: Molecular strong-field approximation is applied to above-threshold detachment of homonuclear diatomic molecular negative ions. Differences between the photodetachment amplitudes for neutral diatomic molecules and diatomic anions, for both direct and rescattered electrons, are examined. Numerical results for the photoelectron spectra of C_2^- molecular anions for different intensities and wavelengths of a linearly polarized laser field and different molecular anion orientations are shown and discussed. Two-center destructive interference minima (suppression regions) in the rescattering part of the photoelectron spectra are observed. For molecules with molecular orientation defined by the angle θ_L with respect to the laser-field polarization axis, these minima manifest as two parallel straight lines in the distribution of the photoelectron yield presented in the photoelectron momentum plane. These lines make the angle $90^\circ - \theta_L$, with the momentum component parallel to the laser-field polarization axis. Focal-averaged photoelectron spectra are also presented and analyzed.

8. M. Busuladžić, A. Gazibegović-Busuladžić, A. Čerkić, and D. B. Milošević: *Signature of molecular symmetry in the plateau region of the photoelectron spectra: Above-threshold ionization of the C_2 molecule*, Phys. Scr. **95**, 075402 (2020) (WoS)

Abstract: By analyzing angular and energy distributions of the photoelectrons emitted in strong-laser-field-induced ionization of molecules, one can obtain information about the molecular structure and the ground-state symmetry. High-energy part of the photoelectron spectra in the above-threshold ionization (ATI) is characterized by a plateau region in which the ionization probability is practically energy independent. The photoelectron yield drops off exponentially for electron energies higher than some critical energy, i.e. the mentioned plateau is followed by an abrupt cutoff. We investigate the influence of the molecular ground state symmetry on this plateau region and show that, analyzing the corresponding high-order ATI spectra, one can obtain information about the highest occupied molecular orbitals (HOMOs) of the considered molecules. We present results for different homonuclear diatomic molecules: N_2 , O_2 , Ar_2 and C_2 having, respectively, the σ_g , π_g , σ_u and π_u symmetries of the HOMO. Particular attention is devoted to the C_2 molecule since high-order ATI spectra for this molecule have not been analyzed yet. We consider ATI by a linearly polarized laser field for which the mentioned plateau can be well-developed, depending on the orientation of the molecular axis with respect to the laser-field polarization axis. The HOMO-symmetry-dependent (dis)appearance of the plateau is particularly pronounced for the parallel and perpendicular orientations. Our findings are valid for a wide range of the laser-field intensities and wavelengths, which is

important for realization of the suggested experiments. Using the improved molecular strong-field approximation, the theory which is particularly suitable for the analysis of high-energy ATI spectra, for the case of the C_2 molecule and different molecular and laser parameters, we investigate various features of the plateau, such as its length and the interference minima and their positions.

9. D. Habibović, A. Gazibegović-Busuladžić, M. Busuladžić, A. Čerkić, and D. B. Milošević: *Strong-field ionization of homonuclear diatomic molecules using orthogonally polarized two-color laser fields*, Phys. Rev. A: General Physics **102**, 023111 (2020) (WoS)

Abstract: Using the improved molecular strong-field approximation we investigate high-order above-threshold ionization (HATI) of homonuclear diatomic molecules by an orthogonally polarized two-color (OTC) laser field. The OTC field components are linearly polarized, having the relative phase ϕ and frequencies $r\omega$ and $s\omega$ (r and s are integers and ω is the fundamental frequency). The molecule is aligned in the laser-field polarization plane. We have found that for even values of $r + s$ the HATI spectra obey the C_2 rotational symmetry regardless of the relative phase, component intensities, and molecular orientation, while the spectra calculated for odd values of $r + s$ and for certain molecular orientations exhibit the reflection symmetry. We have also explored the symmetry transformations of the HATI spectra for a shift of the relative phase by 180° and for various values of r and s . These symmetries are illustrated by numerical examples of the HATI spectra of the N_2 molecule. For particular values of the laser-field parameters, internuclear distance, and the electron emission angle we observed minima in the ionization yield as a function of the molecular orientation angle and the photoelectron energy. These minima are well fitted with the curve obtained using a condition for the destructive interference minima which we derived for an arbitrary laser field and applied to the OTC field. The relative phase between the OTC field components can be used to control the length and shape of the HATI plateau, as well as the appearance of these destructive interference minima.

10. D. Habibović, A. Gazibegović-Busuladžić, M. Busuladžić, A. Čerkić, and D. B. Milošević: *Laser-induced processes with homonuclear diatomic molecules in orthogonally polarized two-color laser field*, J. Phys.: Conf. Ser. **1814**, 012001 (2021) (Scopus)

Abstract. Using our theory which is based on the strong-field approximation we analyze high-order above-threshold ionization and high-order harmonic generation processes for the case of the homonuclear diatomic molecules exposed to an orthogonally polarized two-color (OTC) laser field. The OTC field represents a superposition of two linearly polarized fields with mutually orthogonal polarizations and different frequencies. We analyze the photoelectron energy spectra and the harmonic ellipticity as a function of the ratio of the intensities of the OTC laser-field components and the relative phase. Some combinations of the values of these parameters lead to the high-energy electrons, while the harmonic ellipticity depends strongly on the ratio of the intensities of the laser-field components. It is possible to find the value of this ratio for which the ellipticity of the emitted harmonics is large. The signs of ellipticity are opposite for the molecular orientations which are connected through the reaction with respect to the axis along the first OTC field component. This symmetry is explained using the expression which relates the T -matrix element and the harmonic ellipticity.

11. D. Habibović, A. Gazibegović-Busuladžić, M. Busuladžić, and D. B. Milošević: *Strong-field ionization of heteronuclear diatomic molecules using an orthogonally polarized two-color laser field*, Phys. Rev. A: General Physics **103**, 053101 (2021) (WoS)

Abstract: We apply the improved molecular strong-field approximation to investigate high-order above-threshold ionization (HATI) of heteronuclear diatomic molecules by an orthogonally polarized two-color (OTC) laser field. The OTC field consists of two linearly polarized components with frequencies $r\omega$ and $s\omega$, where r and s are integers, and ω is the fundamental frequency. The molecule is aligned in the OTC laser field polarization plane. We show that the photoelectron momentum distribution obeys one reflection symmetry which is valid for arbitrary values of the relative phase between the OTC field components in the case when $r + s$ is odd. For molecules oriented along the polarization axis z_L of the $r\omega$ component ($\theta_L = 0^\circ$) and r even and s odd, the HATI spectrum exhibits the reflection symmetry with respect to the z_L axis. When the molecular orientation is along the x_L axis, which is perpendicular to the polarization axis of the $r\omega$ component ($\theta_L = 90^\circ$), the spectrum exhibits the reflection symmetry with respect to the x_L axis for r odd and s even. In addition, we analyze the asymmetry in the photoelectron spectra of heteronuclear molecules by comparing them with the photoelectron spectra obtained ionizing a homonuclear diatomic molecule. We also explore the influence of the shift of the relative phase by 180° on the HATI spectra. We explain some characteristics of the obtained HATI spectra using a generalization of the classical two-dimensional simple man's model which includes ionization probabilities calculated using the imaginary-time method. Finally, we analyze the interference minima for different heteronuclear diatomic molecules and for particular values

of the emission angle, laser-field parameters, and internuclear distance. These minima are well fitted with the curve obtained using the derived condition for the two-center destructive interference minima.

12. D. Habibović, A. Gazibegović-Busuladžić, M. Busuladžić, and D. B. Milošević: *Characteristics of the molecular above-threshold ionization by a bichromatic elliptically polarized field with co-rotating components*, J. Phys. B: At. Mol. Opt. Phys. **55**, 085601 (2022) (WoS)

Abstract: We address ionization of a diatomic molecule by a bichromatic elliptically polarized field with co-rotating components. Using the strong-field approximation we investigate symmetry properties of the photoelectron momentum distribution and explore the minima which appear in the photoelectron spectra. We distinguish two types of minima: (i) two-center interference minima which appear due to the destructive interference of the contributions of two electron wave packets emitted from the two centers of the diatomic molecule and (ii) the one-center minima which are caused by the interference of the parts of the wave packet emitted from the same atomic center at different times. The position of the two-center interference minima depends on the molecular orientation. When a molecular orbital is modelled using the atomic orbitals of a specific parity, the position of the two-center interference minima does not depend on the ellipticity of our driving field. However, when a molecular orbital consists of both odd and even atomic orbitals the interference of their contributions and the position of the minima depend on the ellipticity. The position of the interference minima in the photoelectron momentum plane is confirmed using the saddle-point method. The position and the number of the one-center minima do not depend on the molecular orientation, but they strongly depend on the ellipticity of the field components. Finally, comparing the photoelectron spectra of the CO molecule with the spectra of homonuclear molecules and the NO molecule we show that the electron probability density distribution plays a significant role for the high-energy rescattered electrons.

Radovi iz drugih oblasti fizike

1. Dž. Dervić, Dž. Salibašić, A. Gazibegović-Busuladžić, and V. Mešić: *Teaching Physics with simulations: teacher-centered versus student-centered approaches*, Journal of Baltic Science Education **17** (2), 288-299 (2018) (WoS)

2. E. Đedović, A. Gazibegović-Busuladžić, M. Busuladžić, and A. Beganović: *Comparison of Specific Fractal and Multifractal Parameters for Certain Regions of Interest from Digital Mammograms*, IFMBE Proceedings **73**, pp. 143-148 (2019) (WoS)

3. E. Đedović, A. Gazibegović-Busuladžić, and M. Busuladžić: *How differently generated clinical tasks affect the observer performances in CT images analysis*, IFMBE Proceedings **84** (91), 800-808 (2021) (Scopus)

4. A. Skopljak-Beganović, L. M. Čiva, E. Đedović, S. Zulić Hrelja, A. Gazibegović-Busuladžić, and A. Beganović: *Evaluation of the Effectiveness of Protective Aprons in the Primary and Scattered Radiation X-Ray Beam*, IFMBE Proceedings **84** (93), 817-825 (2021) (Scopus)

Radovi na međunarodnim naučnim konferencijama

1. D. Habibović, A. Čerkić, M. Busuladžić, A. Gazibegović-Busuladžić, S. Odžak, E. Hasović, and D. B. Milošević: *Molecules in a bicircular strong laser field*, VI International School and Conference on Photonics, Belgrade, Serbia, August 28 - September 01, p. 65 (2017).

2. A. Gazibegović-Busuladžić, D. B. Milošević, M. Busuladžić, and E. Hasović: *Strong-field ionization of molecules by bicircular laser field*, QUTIF International Conference 2017 in Bad Honnef, Bad Honnef-Bonn, Germany, September 03-07 (2017).

3. A. Gazibegović-Busuladžić, M. Busuladžić, A. Čerkić, E. Hasović, W. Becker, and D. B. Milošević: *Strong-field ionization of linear molecules by a bichromatic elliptically polarized laser field with coplanar counterrotating or corotating components of different frequencies*, Laser Physics Workshop (LPHYS' 18), Nottingham, United Kingdom, July 16-20, S2.9.4, p. 33 (2018).

4. A. Gazibegović-Busuladžić, M. Busuladžić, and D. B. Milošević: *Symmetries in molecular HATI*, Physics Conference in Bosnia and Herzegovina, Sarajevo, Bosnia and Herzegovina, October 25-26, p. 30 (2018).

5. M. Hamzić, A. Gazibegović-Busuladžić, A. Čerkić, D. B. Milošević and M. Busuladžić: *Strong-field ionization of diatomic molecules by a two-color laser field*, Physics Conference in Bosnia and Herzegovina, Sarajevo, Bosnia and Herzegovina, October 25-26, p. 44 (2018).
6. E. Đedović, A. Gazibegović-Busuladžić, M. Busuladžić, and A. Beganović: *Comparison of Specific Fractal and Multifractal Parameters for Certain Regions of Interest from Digital Mammograms*, The 3rd Conference of Medical and Biological Engineering in Bosnia and Herzegovina (CMBEBiH 2019), Banja Luka, Bosnia and Herzegovina, May 16-18, S4-6/ p. 76, (2019).
7. D. Habibović, A. Gazibegović-Busuladžić, M. Busuladžić, A. Čerkić, and D. B. Milošević: *Laser-induced processes in orthogonally polarized two-color laser field*, Physics Conference in Bosnia and Herzegovina, Sarajevo, Bosnia and Herzegovina, October 19, pp. 20-21 (2020).
8. E. Đedović, A. Gazibegović-Busuladžić, and M. Busuladžić: *How differently generated clinical tasks affect the observer performances in CT images analysis*, International Conference on Medical and Biological Engineering in Bosnia and Herzegovina (CMBEBiH 2021), Mostar, Bosnia and Herzegovina, April 21-24, S15-2, ID099 (2021).
9. A. Skopljak-Beganović, L. M. Čiva, E. Đedović, S. Zulić Hrelja, A. Gazibegović-Busuladžić, and A. Beganović: *Evaluation of the Effectiveness of Protective Aprons in the Primary and Scattered Radiation X-Ray Beam*, International Conference on Medical and Biological Engineering in Bosnia and Herzegovina (CMBEBiH 2021), Mostar, Bosnia and Herzegovina, April 21-24, S15-4, ID116 (2021).
10. D. Habibović, A. Gazibegović-Busuladžić, M. Busuladžić, and D. B. Milošević: *Strong-field ionization of diatomic molecules and molecular anions: interferences and classical model*, VIII International School and Conference on Photonics, Belgrade, Serbia, August 23-27, p. 65 (2021).
11. A. Gazibegović-Busuladžić and A. Esquembre Kucukalic, *Mogućnosti za naučnu diplomatiju u BiH*, 2nd Mediterranean Congress "Music and Science" in Valencia, Spain, November 27 (2021).

Naučnoistraživački projekti

1. "Uticaj simetrija molekula i laserskog polja na spektre rasijanih elektrona i X zraka", projekat podržan od Federalnog ministarstva obrazovanja i nauke, Federacija Bosne i Hercegovine, 2017/2018. (voditeljica projekta prof. dr. Azra Gazibegović-Busuladžić)
2. „Novi metodi generacije mekih x zraka i rasijanih elektrona pomoću kompleksnih laserskih polja“, projekat finansiran od strane Ministarstva obrazovanja i nauke Kantona Sarajevo, 2019/2020. (voditelj projekta prof. dr. Dejan Milošević)
3. „Uticaj elektromagnetskog zračenja na molekularne anione“, projekat finansiran od strane Ministarstva obrazovanja i nauke Federacije Bosne i Hercegovine 2019/2020. (voditelj projekta prof. dr. Dejan Milošević)
4. „Primjena kompleksnih laserskih polja i terahercnog zračenja u fizici jakih polja i atonauci“, projekat finansiran od strane Ministarstva za nauku, visoko obrazovanje i mlade Kantona Sarajevo, 2021/2022. (voditelj projekta prof. dr. Dejan Milošević)

Organizacija međunarodnih kongresa i skupova

1. Član Organizacionog odbora "Sarajevo School of High Energy Physics" (SSHEP 2018) održane od 15.10. do 20.10. 2018. godine u Sarajevu. Organizatori konferencije su bili CERN, ICTP, Univerzitet u Sarajevu i Univerzitet u Splitu.
2. Član Organizacionog odbora „Heavy Ion Particle Therapy Masterclass School“ održane od 17.05. do 22.05. 2021. online. Organizatori konferencije su bili CERN, CNAO, DKFZ, Imperial College London, Univerzitet u Sarajevu i drugi.

Recenzije u međunarodnim časopisima

Physical Review A (Izdavač: American Physical Society; relevantna baza: Web of Science Core Collection, Current Contents).

UDŽBENICI I MONOGRAFIJE NAKON IZBORA U ZVANJE VANREDNOG PROFESORA

Aner Čerkić, Azra Gazibegović-Busuladžić, Mustafa Busuladžić, Edvin Škaljo: *Fizika II sa primjenama u biologiji i medicini*, Prirodno-matematički fakultet Sarajevo, 2018, ISBN 978-9926-453-06-0.

Mustafa Busuladžić, Hedim Osmanović, Aner Čerkić, Azra Gazibegović-Busuladžić: *Zbirka zadataka iz Fizike sa primjenama u biologiji i medicini*, Prirodno-matematički fakultet Sarajevo, 2019, ISBN 978-9926-453-24-4.

RAD NA RAZVOJU ODSJEKA ZA FIZIKU UNIVERZITETA U SARAJEVU – PRIRODNO-MATEMATIČKOG FAKULTETA

- Voditeljica Vijeća III ciklusa – doktorskog studija fizičkih nauka Prirodno-matematičkog fakulteta Univerziteta u Sarajevu;
- član Radne grupe za osnivanje Laboratorije za produkciju radioizotopa i jona na Odsjeku za fiziku Prirodno-matematičkog fakulteta Univerziteta u Sarajevu;
- član radnog tima Univerziteta u Sarajevu – Prirodno-matematički fakultet za realizaciju projekta “Modernizacija laboratorija na Odsjeku za fiziku”;
- Šef Odsjeka za fiziku 2016-2020.

PEDAGOŠKE AKTIVNOSTI NAKON IZBORA U ZVANJE VANREDNOG PROFESORA

Predmeti koje je kandidatkinja držala na Odsjeku za fiziku u periodu od 2016-2022. godine:

Prvi ciklus studija:

Klasična mehanika I
Klasična mehanika II
Matematičke metode fizike II
Viši kurs optike I (do 2019. godine)
Fizika jonizirajućeg zračenja I (do 2019. godine)
Fizika jonizirajućeg zračenja II

Drugi ciklus studija:

Obrada podataka i modeliranje u fizici
Fourier optika
Odabrani dijelovi savremene fizike
Statistika u medicinskoj radijacionoj fizici (do 2018. godine)

Mentorstva završnih radova II ciklusa na Prirodno-matematičkom fakultetu Univerziteta u Sarajevu

1. “Primjena umjetnih neuralnih mreža u procjeni efektivne doze”, kandidatkinje Hanke Bečirović. Završni rad uspješno odbranjen 21.06.2021. godine.
2. “Dvocentarski minimumi i pojačanja u molekularnim HATI spektrima”, kandidatkinje Ivane Kolorici - Livnjak. Završni rad uspješno odbranjen 22.07.2021. godine.
3. “HATD spektri molekularnih aniona u laserskom polju različitih polarizacija”, kandidatkinje Amine Mević. Završni rad uspješno odbranjen 30.09.2021. godine.

Mentorstvo III ciklusa studija - zajedničkog doktorskog studija „Prirodne i matematičke nauke u obrazovanju“ (smjer: Fizika u obrazovanju) na Prirodno-matematičkom fakultetu Univerziteta u Sarajevu

„Efekti korištenja statičkih i dinamičkih vizualizacija u gimnazijskoj nastavi fizike“, kandidatkinje Dževdete Dervić. Doktorska disertacija uspješno odbranjena 18.10.2019. godine.

PRIJEDLOG SA OBRAZLOŽENJEM

Na osnovu Zakona o visokom obrazovanju Kantona Sarajevo (“Službene novine Kantona Sarajevo broj 33/17”), člana 96. stav f) i člana 194. Statuta Univerziteta u Sarajevu, jedina prijavljena kandidatkinja, Dr. Azra Gazibegović-Busuladžić, vanredna profesorica Univerziteta u Sarajevu – Prirodno-matematičkog fakulteta, ispunjava sve zakonske uslove za izbor u zvanje redovne profesorice za oblast “Teorijska fizika”, jer:

- je provela jedan izborni period u zvanju vanrednog profesora,
- ima dvanaest naučnih radova iz oblasti za koju se bira, objavljenih u priznatim publikacijama koje se nalaze u relevantnim naučnim bazama podataka,
- ima dvije objavljene knjige,
- ima originalni stručni uspjeh – voditeljica je uspješno završenog projekta,
- ima uspješno mentorstvo tri kandidata za stepen drugog ciklusa studija i jedno mentorstvo trećeg ciklusa studija. Kandidatkinja je jedan od dva mentora za doktorski rad iz oblasti fizika u obrazovanju. Pošto mentorstvo nije iz oblasti za koju se kandidatkinja bira, u skladu sa članom 115. stav (2) Zakona o visokom obrazovanju Kantona Sarajevo, moguća je supstitucija mentorstva sa tri dodatna naučna rada objavljena u citatnim bazama podataka, u odnosu na minimalne uslove utvrđene zakonom, što kandidatkinja ispunjava.

Navedeni rezultati su ostvareni nakon izbora kandidatkinje u zvanje vanredne profesorice. Vanredna profesorica dr. Azra Gazibegović-Busuladžić postigla je veoma značajne naučne rezultate. Prema Web of Science Core Collection citatnoj bazi podataka do sada je objavila 41 rad koji su citirani 952 puta. Odgovarajući h indeks tih radova je 16. Bila je voditeljica dva domaća naučnoistraživačkog projekta. Pored toga, posjeduje bogato pedagoško iskustvo, mentorica je više magistarskih radova i koautorica je više univerzitetskih udžbenika.

S obzirom na navedene činjenice, članovi Komisije smatraju da kandidatkinja ispunjava sve zakonom predviđene uslove za izbor u zvanje redovne profesorice. Sa zadovoljstvom predlažemo Vijeću Univerziteta u Sarajevu – Prirodno-matematičkog fakulteta da **izabere dr. Azru Gazibegović-Busuladžić, u zvanje redovne profesorice za oblast “Teorijska fizika”** na Univerzitetu u Sarajevu – Prirodno-matematički fakultet.

U Sarajevu, 08. 07. 2022. godine

dr. Dejan Milošević, redovni profesor

dr. Hrvoje Buljan, redoviti profesor

dr. Krešimir Kumerički, redoviti profesor