



Zoran Jakšić

Naučni savetnik

Naučni rukovodilac Centra za mikroelektronske tehnologije



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Datum i mesto rođenja: 1960 Pančevo, Srbija

Obrazovanje: 2001 doktor elektrotehničkih nauka – Univerzitet u Beogradu, Elektrotehnički fakultet

Zvanja: 2006 naučni savetnik – Univerzitet u Beogradu, Institut za hemiju, tehnologiju i metalurgiju

Članstva u društvima: IEEE Senior Member (Institute of Electric and Electronic Engineers, Piscataway, New Jersey, U.S.A.)
OSA Member (Optical Society)
ETRAN zaslužni član (Društvo za elektroniku, telekomunikacije, računarstvo, automatiku i nuklearnu tehniku)
ODS suosnivač, predsednik Društva (Optičko društvo Srbije)
MTT-S član odbora (Nacionalno društvo za mikrotalasnu tehniku i tehnologije)

Profesionalno iskustvo: 1983 – 1987 vodeći inženjer razvoja, Odeljenje razvoja, Fabrika aviona "Utva", Pančevo
1987 – danas Centar za mikroelektronske tehnologije, IHTM, Univerzitet u Beogradu

Nagrade i priznanja: 1984 Nagrada za najbolji rad, komisija za Elektronske sastavne delove i materijale, 26. ETAN, Zadar
1987 Nagrada "27. jun" za najbolju inovaciju, Gradsko veće Pančeva
2006 Zaslužni član Društva za ETRAN, Beograd
2006 Nagrada za najbolji poster, konferencija IEEE MIEL, Beograd
2011 Broj 1 među top člancima iz oblasti plazmonike 2011, međunarodno društvo za optiku i fotoniku, SPIE
2012 Najbolji usmeno izlagani rad, 28. međunarodna konferencija za mikroelektroniku, Niš

Oblasti interesovanja:

- Mezoskopska i podtalasna elektromagnetna optika/nanooptika i nanofotonika, uključujući materijale sa fotonskim energetskim procesom
- Plazmonika
- Elektromagnetni i optički metamaterijali
- Fotonski senzori, napredne senzorske komponente
- MEMS i NEMS naprave
- Dugotalasni infracrveni poluprovodnički detektori, uključujući naprave sa potiskivanjem Oževovih procesa
- Uskozonalni poluprovodnici

Naučna dostignuća:

- Osnivač prve srpske grupe za plazmoniku i metamaterijale
- Uveo nekoliko novih istraživačkih tematika, uključujući hemijske senzore zasnovane na metamaterijalima, optički šum u refraktometrijskim sensorima, neorganske biomimetičke nanomembrane i plazmonske metode poboljšanja infracrvenih detektora

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Znanje jezika: srpski (maternji), engleski (aktivno), nemački (aktivno), ruski (pasivno), francuski (pasivno)

Najznačajniji projekti: **Međunarodni:**

2008 – 2011 Reinforcement of Regional Microsystems and Nanosystems Centre REGMINA, Proj. No. 205533, 7th Framework Programme, European Union (project co-chair)

2010 – 2012 Biomimetic Ultrathin Structures as a Multipurpose Platform for Nanotechnology-based Products (MultiPlat), Proj. No. 228943, 7th Framework Programme, European Union

2013 – 2016 New permanent magnets for electric-vehicle drive applications (MAG-DRIVE), Proj. ref. 605348, 7th Framework Programme, European Union

Nacionalni:

1986 – 1990 Poluprovodnička mikroelektronika i optoelektronika, ev. br. 2.136, Republička zajednica nauke, Srbija

1991 – 1995 Mikroelektronika i optoelektronika, ev. br. 1001, Republičko ministarstvo za nauku i tehnologiju

1996 – 2000 Mikroelektronika, optoelektronika i mikrosistemske tehnologije", ev. br. 10E05, Ministarstvo za nauku i tehnologiju Republike Srbije

2002 – 2004 Mikrosistemske i nanosistemske tehnologije za senzore i optoelektroniku", IT.1.04.0062.B, Ministarstvo za nauku i zaštitu životne sredine Republike Srbije

2005 – 2007 Mikro i nanosistemske tehnologije, strukture i senzori", TR-6151, Ministarstvo za nauku i zaštitu životne sredine Republike Srbije

2008 – 2010 Mikrosistemske, nanosistemske tehnologije i komponente", 11027, Ministarstvo za nauku i tehnološki razvoj Republike Srbije

2011 – 2016 Mikro, nano-sistemi i senzori za primenu u elektroprivredi, procesnoj industriji i zaštiti životne sredine" (MiNaSiS) TR-32008, Ministarstvo prosvete, nauke i tehnološkog razvoja Republike Srbije

Izabrane publikacije: Monografije

1. **Z. Jakšić**, *Micro and nanophotonics for semiconductor infrared photodetectors: Towards an Ultimate Uncooled Device*, Springer Verlag, Berlin, 2014, pp. 1-245, ISBN 978-3-319-09674-2
2. **Z. Jakšić**, "Optical metamaterials as the platform for a novel generation of ultrasensitive chemical or biological sensors", in *Metamaterials: Classes, Properties and Applications*, ed. E. J. Tremblay, Nova Science Publishers, Hauppauge, New York, pp. 1-42, 2010, ISBN: 978-1-61668-958-2

Poglavlja u monografijama

1. J. Matović, **Z. Jakšić**, "Bionic (Nano)Membranes", Ch. 2 in *Biomimetics – Materials, Structures and Processes. Examples, Ideas and Case Studies*, eds. P. Gruber, D. Bruckner, C. Hellmich, H.-B. Schmiedmayer, H. Stachelberger, and I. C. Gebeshuber, Springer 2011, ISBN: 978-3-642-11933-0, DOI 10.1007/978-3-642-11934-7, pp. 9-24, 2011
2. **Z. Jakšić**, J. Matović, "Nanomembrane-Enabled MEMS Sensors: Case of Plasmonic Devices for Chemical and Biological Sensing", in *Micro Electronic and Mechanical Systems*, K. Takahata ed, In-Tech, 2009, ISBN 978-953-307-027-8
3. J. Matović, **Z. Jakšić**, "Nanomembrane: A New MEMS/NEMS Building Block", in *Micro Electronic and Mechanical Systems*, K. Takahata ed, In-Tech, Vienna, Austria, 2009, ISBN 978-953-307-027-8
4. Z. Djurić, **Z. Jakšić**, W. Ehrfeld, A. Schmidt, M. Matic, M. Popović, "Photonic Crystal Enhancement of Auger-Suppressed Detectors: A Way to Background-Limited Room-Temperature Operation in 3-14 Micrometer Range", in *Nanoscale Linear and Nonlinear Optics*, Eds. M. Bertolotti, C. M. Bowden, C. Sibilia, vol. 560, pp. 418-424, AIP, Melville, New York, 2001.

Radovi u časopisima

1. D. Tanasković, M. Obradov, O. Jakšić, **Z. Jakšić**, "Nonlocal effects in double fishnet metasurfaces nanostructured at deep subwavelength level as a path towards simultaneous sensing of multiple chemical analytes", *Photonics and Nanostructures – Fundamentals and Applications* vol. 18, pp. 36–42, 2016
2. M. Dalarsson, M. Norgren, **Z. Jakšić**, "Exact analytical solution for fields in a lossy cylindrical structure with linear gradient index metamaterials", *Progress In Electromagnetics Research*, Vol. 151, pp. 109–117, 2015
3. D. Tanasković, **Z. Jakšić**, M. Obradov, O. Jakšić, "Super unit cells in aperture-based metamaterials", *Journal of Nanomaterials*, Vol. 2015, Article ID 312064, 1-9, Jan 2015
4. O. Jakšić, I. Jokić, **Z. Jakšić**, Ž. Čupić, Lj. Kolar-Anić, "Adsorption-induced fluctuations and noise in plasmonic metamaterial devices", *Phys. Scr.* vol. T162, art. 014047 pp. 1-4, Sep 2014
5. D. Tanasković, M. Obradov, O. Jakšić, **Z. Jakšić**, "A low-loss double fishnet metamaterial based on transparent conductive oxide", *Phys. Scr.* vol. T162, art. 014048 pp. 1-4, Sep 2014
6. M. Obradov, **Z. Jakšić**, D. Vasiljević Radović, "Plasmonic Suppression of Generation-Recombination Noise in Semiconductor Infrared Detectors", *J. Opt.* 16, pp. 125011.1-10, 2014
7. O. Jakšić, D. Randjelović, **Z. Jakšić**, Ž. Čupić, Lj. Kolar-Anić, "Plasmonic Sensors in Multi-Analyte environment: rate constants and transient analysis", *Chem. Eng. Research and Design*, 92, pp. 91-101, Jan. 2014
8. D. Randjelović, M. Frantlović, B. Miljković, B. Popović, **Z. Jakšić**, "Intelligent Thermal Vacuum Sensors Based on Multipurpose Thermopile MEMS Chips", *Vacuum*, Vol. 101, pp. 118124, March 2014
9. O. Jakšić, **Z. Jakšić**, Ž. Čupić, D. Randjelović, Lj. Kolar-Anić, "Fluctuations in Transient Response of Adsorption-Based Plasmonic Sensors", *Sens. Act. B: Chemical*, Vol. 190, pp. 419428, January 2014
10. C. J. Zapata-Rodriguez, J. J. Miret, S. Vuković, **Z. Jakšić**, "Dyakonons in hyperbolic metamaterials", *Photonics Letters of Poland*, vol. 5 (2), pp. 63-65, 2013
11. **Z. Jakšić**, D. Pantelić, M. Sarajlić, S. Savić-ević, J. Matović, B. Jelenković, D. Vasiljević-Radović, S. Čurčić, S. Vuković, V. Pavlović, J. Buha, V. Lačković, M. Labudović-Borović, B. Čurčić, "Butterfly scales as bionic templates for complex ordered nanophotonic materials: A pathway to biomimetic plasmonics", *Optical Materials* Vol. 35, Iss. 10, pp. 18691875, August 2013
12. M. Dalarsson, M. Norgren, T. Asenov, N. Dončov, **Z. Jakšić**, "An Exact Analytical Solution for Fields in Gradient Index Metamaterials with Different Loss Factors in Negative and Positive Refractive Index Segments", *Journal of Nanophotonics*, Vol. 7, 073086-1-13, 2013
13. O. Jakšić, Ž. Čupić, **Z. Jakšić**, D. Randjelović, Lj. Kolar-Anić, "Monolayer Gas Adsorption in Plasmonic Sensors: Comparative Analysis of Kinetic Models", *Russian Journal of Physical Chemistry A*, Vol. 87, No. 13, pp. 202, 2013
14. J. J. Zapata-Rodriguez, **Z. Jakšić**, S. Vuković, M. Belić, "Substantial enlargement of angular existence range for Dyakonov-like surface waves at semi-infinite metal-dielectric superlattice", *J. Nanophoton.* 6(1), 063525, 2012
15. J. Matović, N. Adamović, F. Radovanović, **Z. Jakšić**, U. Schmidt, "Field effect transistor based on ions as charge carriers", *Sensors and Actuators B: Chemical*, vol. 170, pp. 137142, 2012
16. S. M. Vuković, J. J. Miret, C. J. Zapata-Rodriguez, **Z. Jakšić**, "Oblique Surface Waves at an Interface of

- Metal-dielectric Superlattice and an Isotropic Dielectric", *Physica Scripta*, T149, pp. 014041.1-3, 2012
17. **Z. Jakšić**, Z. Popović, I. Djerdj, K. Radulović, "Functionalization of plasmonic metamaterials utilizing metal-organic framework thin films", *Physica Scripta*, T149, pp. 014051.1-4, 2012 ("Highlights of the Year 2012")
 18. M. Dalarsson, M. Norgren, N. Dončov, **Z. Jakšić**, "Lossy gradient index transmission optics with arbitrary periodic permittivity and permeability and constant impedance throughout the structure", *J. Optics*, 14, 065102.1-7, 2012
 19. **Z. Jakšić**, M. Milinović, D. Randjelović, "Nanotechnological Enhancement Of Infrared Detectors By Plasmon Resonance In Transparent Conductive Oxide Nanoparticles", *Journal of Mechanical Engineering* vol. 58, No. 6, pp. 367-375, 2012
 20. M. Dalarsson, M. Norgren, **Z. Jakšić**, "Lossy Wave Propagation through a Graded Interface to a Negative Index Material Case of Constant Impedance", *Microwave Review*, Vol. 17, No. 2, pp. 2-6, 2011
 21. **Z. Jakšić**, S. Vuković, J. Buha, J. Matović, "Nanomembrane-Based Plasmonics", *J. Nanophotonics*, Vol. 5, pp. 051818-1-21, 2011
 22. M. Dalarsson, M. Norgren, **Z. Jakšić**, "Lossy gradient index metamaterial with sinusoidal periodicity of refractive index: case of constant impedance throughout the structure", *J. Nanophotonics*, Vol. 5, pp. 051804-1-8, 2011
 23. S. Vuković, **Z. Jakšić**, I. V. Shadrivov, Y. S. Kivshar, "Plasmonic Crystal Waveguides", *Applied Physics A*, 103, pp. 615617, 2011
 24. **Z. Jakšić**, S. Vuković, J. Matović, D. Tanasković, "Negative Refractive Index Metasurfaces for Enhanced Biosensing", *Materials*, 4 (1), pp. 1-36, 2011
 25. S. Vuković, **Z. Jakšić**, J. Matović, "Plasmon Modes on Laminated Nanomembrane-based Waveguides", *J. Nanophotonics*, Vol. 4, 041770, pp. 1-10, 2010
 26. J. Matović, **Z. Jakšić**, "Three-dimensional surface sculpting of freestanding metal-composite nanomembranes", *Microel. Eng.*, 87, 5-8, pp. 14871490, 2010
 27. O. Jakšić, **Z. Jakšić**, J. Matović, "Adsorption-Desorption Noise in Plasmonic Chemical/Biological Sensors for Multiple Analyte Environment", *Microsystem Technologies* Vol. 16, Iss. 5, pp. 735-743, 2010
 28. J. Matović, **Z. Jakšić**, "A comparative analyze of fundamental noise in cantilever sensors based on lateral and longitudinal displacement Case of thermal infrared detectors", *Microsystem Technologies*, Vol. 16, Iss. 5, pp. 755-763, 2010
 29. **Z. Jakšić**, Jovan Matović, "Functionalization of Artificial Freestanding Composite Nanomembranes", *Materials*, Vol. 3, pp. 165-200, 2010
 30. M. Dalarsson, **Z. Jakšić**, P. Tassin, "Structures Containing Left-Handed Metamaterials with Refractive Index Gradient: Exact Analytical Versus Numerical Treatment", *Microwave Review*, Vol. 15, No.2, pp. 1-5
 31. M. Dalarsson, P. Tassin, **Z. Jakšić**, "Exact analytical solution for oblique incidence on a graded index interface between a right-handed and a left-handed material", *Journal of Optoelectronics and Biomedical Materials*. Vol. 1, Issue 3, p. 269 276, Sep. 2009
 32. J. Matović, **Z. Jakšić**, "Simple and reliable technology for manufacturing metal-composite nanomembranes with giant aspect ratio", *Microelectronic Engineering*, 86, pp. 906-909, 2009
 33. **Z. Jakšić**, S. Ostojić, D. Tanasković, J. Matović, "Vacuum fluctuations in optical metamaterials containing nonlinear dielectrics", *Acta Physica Polonica A*, 116, 4, pp. 628-630, 2009
 34. **Z. Jakšić**, D. Tanasković, J. Matović, "Fishnet-based metamaterials: spectral tuning through adsorption mechanism", *Acta Physica Polonica A*, 116, 4, pp. 333-335, 2009
 35. **Z. Jakšić**, O. Jakšić, J. Matović, "Performance limits to the operation of nanoplasmonic chemical sensors noise equivalent refractive index and detectivity", *Journal of Nanophotonics*, Vol. 3, pp. 031770-1-13, 2009
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 37. **Z. Jakšić**, M. Maksimović, M. Sarajlić, D. Tanasković, "Surface plasmon-polariton assisted metal-dielectric multilayers as passband filters for ultraviolet range", *Acta Physica Polonica Series A*, 112, 5, pp. 954-958, 2007
- (ukupno 77 članaka u naučnim časopisima)

Izlaganja po pozivu

1. **Z. Jakšić**, "Optical Chemical Sensors for Industrial Applications", *Proc. X Internat. Symp. On Industrial Electronics INDEL*, Banja Luka, Keynote paper, pp. 16-31, Nov. 6-8, 2014, ISBN 978-99955-46-22-9
2. **Z. Jakšić**, "Nanoplasmonic Chemical Sensors", *Proc. 29th International Conference on Microelectronics MIEL*, Belgrade, pp. 47-54 (keynote paper), May 12-15, 2014, ISBN 978-1-4799-5295-3
3. **Z. Jakšić**, "Nanotechnological Enhancement of Semiconductor Detectors for Night Vision", *Night Vision Conference*, London, p. 5, June 5-6, 2013
4. **Z. Jakšić**, "Nanophotonics and Nanoplasmonics for the Enhancement of Intrinsic Semiconductor Infrared Detectors", *4th Mediterranean Conference on Nano-Photonics MediNano-4*, ed. Z. Zalevsky, E. Ozbay, Oct. 24-25, 2011, Rome, Italy, p. 14
5. **Z. Jakšić**, "Tesla's 'World System' Versus Contemporary Plasmonics: Where Two Extremes Meet", *Proc. 7th International Symposium Nikola Tesla*, Belgrade, Serbia, Nov. 23, 2011, pp. 29-36, isbn 978-86-7466-421-6
6. **Z. Jakšić**, J. Matović, J. Buha, "Composite Freestanding Nanomembranes: A Multifunctional Platform for Chemical Sensing", *Proc. 10th Internat. Conf. on Fundamental and Applied Aspect of Physical Chemistry*, Belgrade, Sep. 21-24, Vol. 2, pp. 453-460, 2010, isbn 978-86-82475-18-7
7. **Z. Jakšić**, "Nanomembrane-Based Plasmonics", *3rd Mediterranean Conference on Nanophotonics MediNano-3*, Belgrade, Serbia, October 18 and 19, 2010, p. 28, ISBN 978-86-82441-28-1

8. **Z. Jakšić**, "Nanophotonic Structures for Ultra-Compact, All-Optical Multiparameter Sensors", Workshop on Synthesis and Characterization of Biological/Non Biological Interfaces, JRC Ispra, Nov. 29-30, 2005
 9. **Z. Jakšić**, N. Dalarsson, M. Maksimović, "Electromagnetic Structures Containing Negative Refractive Index Metamaterials", Proc. 7th International Conference on Telecommunications in Modern Satellite, Cable and Broadcasting Services TELSIKS '05, September 28 30, 2005, Ni, Vol. 1, pp. 145-154
 10. **Z. Jakšić**, M. Maksimović, "Ordered Artificial Nanocomposites for Imaging Beyond Diffraction Limit," Proc. 1st International Workshop on Nanoscience & Nanotechnology IWON 2005, Belgrade, November 15 - 18, 2005, pp. 147-156
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