

Institute of Physics

Chair of Applied Electrodynamics and Modeling

Head of the chair, professor

📖 Publications

Article

Dielectric coated conductive rod resonantly coupled with a cut transmission line as a tunable microwave bandstop filter and sensor

David Hambaryan, Tigran Abrahamyan, Henrik Parsamyan, Artyom Movsisyan, Bill Minasyan,

Hovhannes Haroyan, Arsen Babajanyan, Kiejin Lee, Barry Friedman, Khachatur Nerkararyan

Heliyon 2024 e24477

Article

Characterization of interaction phenomena of electromagnetic waves with metamaterials via microwave near-field visualization technique

Zhirayr Baghdasaryan, Arsen Babajanyan, Barry Friedman, Kiejin Lee

Scientific Reports 2023 18457

Article

3D visualization of microwave electric and magnetic fields by using a metasurface-based indicator

Zhirayr Baghdasaryan, Arsen Babajanyan, Henrik Parsamyan, Barry Friedman, Seungwan Kim,

Jung-Ha Lee, Kiejin Lee

Scientific Reports 2022 6150

Article

Characterization of Metal Nanoparticles Aqueous Solution by a Thermoelastic Optical Indicator Microscope

G. Ohanyan, N. Margaryan, M. Manvelyan, L. Odabashyan, B. Minasyan, A. Movsisyan, R. Khachatryan,

A. Babajanyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2022 187-191

Article

3D Visualization Method Based on Metastructure Optical Indicator of Thermoelastic Polarization Microscope for Electromagnetic Fields in Microwave and THz Ranges

A. Babajanyan, Zh. Baghdasaryan, H. Parsamyan, B. Friedman, K. Lee

NanoWorld Journal 2022 S4

Article

Resonant Interaction Between Microwaves and Thin Conducting Microstructure with Finite Length

T. Abrahamyan, H. Haroyan, D. Hambaryan, H. Parsamyan, K. Lee, A. Babajanyan, Kh. Nerkararyan

NanoWorld Journal 2022 S5

Article

Microwave and Joule Heating Visualization by a Thermo-Elastic Microscope for Carbon Composite Materials

Sh. Arakelyan, A. Babajanyan, G. Berthiau, B. Friedman, K. Lee

Springer Proceedings in Physics (Optics and Its Applications) 2022 69-77

Article

Surface-standing-wave formation via resonance interaction of a finite-length conductive rod with microwaves

Tigran Abrahamyan, Hovhannes Haroyan, David Hambaryan, Henrik Parsamyan, Arsen Babajanyan, Kiejin Lee, Barry Friedman, Khachatur Nerkararyan

Journal of Physics D: Applied Physics 2022 445001

Article

Microwave response phase control of a graphite microstrip

Arsen Babajanyan, Tigran Abrahamyan, Hovhannes Haroyan, Billi Minasyan, Torgom Yezekyan, Kiejin Lee, Barry Friedman, Khachatur Nerkararyan

Carbon 2022 151-156

Article

Noninvasive in Vivo Evaluation of Mouse-Blood Glycemia with a Microwave Spiral Sensor

A. Babajanyan, B. Minasyan, L. Odabashyan, S. Kim, J. Kim, J.-H. Lee, B. Friedman, K. Lee

Journal of Contemporary Physics (Armenian Academy of Sciences) 2021 47-54

Article

Visualization of microwave near-field distribution in sodium chloride and glucose aqueous solutions by a thermo-elastic optical indicator microscope

Arsen Babajanyan, Zhirayr Baghdasaryan, Levon Odabashyan, Jung-Ha Lee, Barry Friedman, Kiejin Lee

Scientific Reports 2021 2589

Article

Performance of Pentacene Based Organic Thin Film Transistor with an Octadecyltrichlorosilane Self-Assembled Monolayer Interface

A. Babajanyan, B. Minasyan, A. Movsisyan, B. Friedman, K. Lee

Journal of Contemporary Physics (Armenian Academy of Sciences) 2021 208-213

Manual

Ատոմային և միջուկային ֆիզիկայի ընդհանուր դասընթացի լաբորատոր աշխատանքների ուղեցույց

Հասմիկ Շահինյան, Լուսինե Ղազարյան, Արսեն Բաբաջանյան

2021 64

Article

Detection of Iron Nanoparticles in Aqueous Solutions by Microwave Sensor

L. Odabashyan, N. Margaryan, G. Ohanyan, M. Manvelyan, D. Hambaryan, T. Abrahamyan, R. Khachatryan, A. Babajanyan

Journal of Contemporary Physics (Armenian Academy of Sciences) 2020 171-175

Article

Thermal distribution in unidirectional carbon composite material due to the direct heating and microwave influence visualized by a thermo-elastic optical indicator microscope

Zhirayr Baghdasaryan, Arsen Babajanyan, Levon Odabashyan, Shant Arakelyan, Hanju Lee,
Gerard Berthiau, Barry Friedman, Kiejin Lee
Measurement 2020 107189(1-7)

Article

**ОБНАРУЖЕНИЕ НАНОЧАСТИЦ ЖЕЛЕЗА В ВОДНЫХ РАСТВОРАХ С ПОМОЩЬЮ
МИКРОВОЛНОВОГО СЕНСОРА**

Л. ОДАБАШЬЯН, Н. МАРГАРЯН, Г. ОГАНЯН, М. МАНВЕЛЯН, Д. АМБАРЯН, Т. АБРААМЯН, Р. ХАЧАТРЯН,
А. БАБАДЖАНИЯН
Известия НАН РА. Физика (Journal of Contemporary Physics (Armenian Academy of Sciences) 2020
251-258

Article

COMPUTER MODELING OF MICROWAVE STRIPLINE RESONATORS FOR NON-INVASIVE SENSING

A. Zh. BABAJANYAN, B. J. MINASYAN, L. A. ODABASHYAN, Zh. A. BAGHDASARYAN, K. LEE
Proceedings of the YSU. Physical and Mathematical Sciences 2019 60-64

Article

**Antenna Investigation by a Thermoelastic Optical Indicator Microscope: Defects Measurement
and 3D Visualization of Electromagnetic Fields**

Arsen Babajanyan, Shant Arakelyan, Hanju Lee, Seungwan Kim, Gerard Berthiau, Barry Friedman,
Kiejin Lee
IEEE ANTENNAS AND PROPAGATION MAGAZINE 2019 27-31

Article

Investigation of Ag Nanoparticles/Water Solutions by Microwave Stripline Sensor

A. Babajanyan, T. Abrahamyan, R. Khachatryan, D. Hambaryan, B. Hovhannisyanyan, B. Minasyan,
L. Odabashyan
Journal of Contemporary Physics (Armenian Academy of Sciences) 2019 196-202

Article

**ИССЛЕДОВАНИЕ РАСТВОРОВ НАНОЧАСТИЦ Ag В ВОДЕ С ПОМОЩЬЮ МИКРОВОЛНОВОГО
ПОЛОСКОВОГО СЕНСОРА**

А. БАБАДЖАНИЯН, Т. АБРАМЯН, Р. ХАЧАТРЯН, Д. АМБАРЯН, Б. ОГАНЕСЯН, Б. МИНАСЯН,
Л. ОДАБАШЯН
Известия НАН РА. Физика (Journal of Contemporary Physics (Armenian Academy of Sciences) 2019
263-271

Article

Real-time sensing the glucose concentration by quadratic-shaped microwave sensor

A. Zh. BABAJANYAN, B. A. HOVHANNISYAN, D. S. HAMBARYAN, L. A. ODABASHYAN
Proceedings of the YSU. Physical and Mathematical Sciences 2019 132-137

Article

**Real-Time Noninvasive Measurement of Glucose Concentration Using a Modified Hilbert
Shaped Microwave Sensor**

Levon Odabashyan, Arsen Babajanyan, Zhirayr Baghdasaryan, Seungwan Kim, Jongchel Kim,
Barry Friedman, Jung-Ha Lee, Kiejin Lee
Sensors 2019 5525(1-11)

Article

Microwave Heating Visualization for Carbon Fibers Composite Material: Development of Tunable Microstrip Structures

Shant Arakelyan, Hanju Lee, Do-Suck Han, Arsen Babajanyan, Gerard Berthiau, Barry Friedman,

Kiejn Lee

IEEE Transactions on Microwave Theory and Techniques 2018 883-888

Article

Microwave Fractal Bandpass Filters Based on Modified Hilbert Curves of the First and the Second Orders

A. Babajanyan, H. Parsamyan, K. Lee

Journal of Contemporary Physics (Armenian Academy of Sciences) 2018 146-151

Article

МИКРОВОЛНОВЫЕ ФРАКТАЛЬНЫЕ ПОЛОСОВЫЕ ФИЛЬТРЫ, ОСНОВАННЫЕ НА МОДИФИЦИРОВАННЫХ КРИВЫХ ГИЛЬБЕРТА ПЕРВОГО И ВТОРОГО ПОРЯДКОВ
Г. ПАРСАМЯН, А. БАБАДЖАНЫАН, К. ЛЕЕ

Известия НАН РА. Физика (Journal of Contemporary Physics (Armenian Academy of Sciences) 2018 193-200

Article

DETERMINATION OF GLUCOSE CONCENTRATION IN AQUEOUS SOLUTION BY USING MODIFIED HILBERT SHAPED MICROWAVE METAMATERIAL SENSOR

H. A. PARSAMYAN, A. Zh. BABAJANYAN, Sh. Kh. ARAKELYAN, K. LEE

Proceedings of the YSU. Physical and Mathematical Sciences 2018 144-148

Article

Performance of Pentacene-based Thin-film Transistors Fabricated at Different Deposition Rates

Arsen Babajanyan, Jinho Hwang, Duri Kim, Meenwoo Kim, Hanju Lee, Levon Odabashyan,

Zhirayr Baghdasaryan, Kiejn Lee, Deokjoon Cha

New Physics: Sae Mulli 2018 1192-1195

Article

Glucose Aqueous Solution Sensing by Modified Hilbert Shaped Microwave Sensor

A. Babajanyan, L. Odabashyan, Zh. Baghdasaryan, B. Friedman, K. Lee

Armenian Journal of Physics 2018 214-222

Article

Visualization of Microwave Heatingformesh-Patterned Indium-tin-Oxide by a Thermo-Elastic Optical Indicator Microscope

A. Babajanyan, Zh. Baghdasaryan, L. Odabashyan, H. Lee, B. Friedman, K. Lee

Armenian Journal of Physics 2018 175-179

Article

Direct imaging of the SSD and USB memory drives heating by thermo-elastic optical indicator microscopy

Shant Arakelyan, Hanju Lee, Yeonghun Jeong, Arsen Babajanyan, Barry Friedman, Kiejn Lee

Case Studies in Thermal Engineering 2017 407-412

Article

Characterization of Anisotropic Electrical Conductivity of Carbon Fiber Composite Materials by a Microwave Probe Pumping Technique

Hanju Lee, Ogsen Galstyan, Arsen Babajanyan, Barry Friedman, Gerard Berthiau, Jongchel Kim,

Do Suck Han, Kiejin Lee

Journal of Composite Materials 2016 1999-2004

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Article

Effects of Thermal Preparation on Copper Phthalocyanine Organic Light Emitting Diodes

Sul A. Choi, Kyungchul Kim, Su Jin Lee, Hanju Lee, Arsen Babajanyan, Barry Friedman, Kiejin Lee

Journal of Luminescence 2016 149-153

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Article

Direct Current Imaging Using a Magneto-Optical Sensor

Shant Arakelyan, Ogsen Galstyan, Hanju Lee, Arsen Babajanyan, Jung-Ha Lee, Barry Friedman, Kiejin Lee

SENSORS AND ACTUATORS A-PHYSICAL 2016 397-401

<http://www.journals.elsevier.com/sensors-and-actuators-a-physical>

Article

Characteristics of Light Transfer in the Connected Conical Waveguides With the Same Symmetry Axis

Shant Arakelyan, Tigran Abrahamyan, Arsen Babajanyan, Khachatur Nerkararyan

Applied Optics 2016 3854-3857

<https://www.osapublishing.org/ao/home.cfm>

Article

Near-Field Scanning Microwave Microscope As Nano-Resolution Characterization Technique

Babajanyan A. J., Friedman B., Lee K.

Физические Основы приборостроения 2016 98-111

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Article

Nondestructive Label-Free Mapping of DNA Bioassay Using a Near-Field Scanning Microwave Microscope

Arsen Babajanyan, Barry Friedman, Kiejin Lee

Armenian Journal of Physics 2016 148-153

<http://ajp.asj-oa.am/>

Article

Specifications of Rabi oscillations in the quantum emitters systems coupled to the localized plasmon polaritons

A. Zh. Babajanyan, S. Kh. Nerkararyan

ԵՊՀ Գիտական տեղեկագիր, Բնական գիտություններ 2016 48-52

<http://ysu.am/science/hy/1355990920>

Article

Pre-Annealing Effects on a Pentacene Organic Thin Film Transistor With a Polymer Dielectric Interface

Arsen Babajanyan, Sul A Choi, Kyungchul Kim, Shant Arakelyan, Hanju Lee, Barry Friedman, Kiejin Lee
PROCEEDINGS of the International Conference on Microwave and THz Technologies, Photonics and
Wireless Communications
2016 61-64
<http://irphe.asj-oa.am/93/1/Proceedings-IRPhE-2016.pdf>

Article

Magneto-Optical Visualization by Bi:YIG Thin Films Prepared at Low Temperatures
Ogsen Galstyan, Hanju Lee, Arsen Babajanyan, Arsen Hakhoumian, Barry Friedman, Kiejin Lee
Journal of Applied Physics 2015 163914. 6
<http://aip.scitation.org/jap/info/contact>

Article

Sensitive Detection of Nano-Scale Vibrations by the Metal-Coated Fiber Tip at the Liquid-Air Interface
A. J. Babajanyan, T. A. Abrahamyan, H. A. Minasyan, Kh. V. Nerkararyan
International Journal of Mechanical, Aerospace, Industrial and Mechatronics Engineering 2015 651-654
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Article

Influence of Bismuth Substitution on Yttriumorthoferrite Thin Films Preparation by the MOD Method
Ogsen Galstyan, Hanju Lee, Jongwon Park, Jung-Ha Lee, Arsen Babajanyan, Barry Friedman, Kiejin Lee
Journal of Magnetism and Magnetic Materials 2015 310-314
<http://www.journals.elsevier.com/journal-of-magnetism-and-magnetic-materials>

Manual

«Վիճակագրական ռադիոֆիզիկա» լաբորատոր աշխատանքների ձեռնարկ
Ա. Ժ. Բաբաջանյան, Վ. Ռ. Թադևոսյան, Հ. Ս. Հարոյան, Ա. Հ. Մակարյան
2012 86

Conference

Sensitive Detection of Nano-Scale Vibrations by the Metal-Coated Fiber Tip at the Liquid-Air Interface
A. J. Babajanyan, T. A. Abrahamyan, H. A. Minasyan, Kh. V. Nerkararyan

Conference

In Vitro Monitoring of HbA1C by a Microwave Biosensor
Seungwan Kim, Jongchel Kim, Armen Abrahamyan, Arsen Babajanyan, Jung-Ha Lee, Barry Friedman,
Kiejin Lee

Conference

Nondestructive label-free mapping of DNA bioassay using a near-field scanning microwave microscope
Arsen Babajanyan, Barry Friedman, Kiejin Lee

Conference

Microwave and Joule Heating Visualization by Thermo-Elastic Sensor for Carbon Fibers Composite Material
Kiejin Lee, Shant Arakelyan, Hanju Lee, Sunghoon Jeon, Do-Suck Han, G. Berthiau, Arsen Babajanyan

Conference

Detection of Resonant Oscillations of the Liquid Surface by using a Tapered Fiber Opto-Mechanical Sensor

Tigran Abrahamyan, Stella Sargsyan, Arsen Babajanyan, Khachatur Nerkararyan

Conference

Pre-Annealing Effects on a Pentacene Organic Thin Film Transistor with a Polymer Dielectric Interface

Arsen Babajanyan, Sul A Choi, Kyungchul Kim, Hanju Lee, Barry Friedman, Kiejin Lee

Conference

The Resonant Coupling of the Quantum Dots in the Environment of Metal Nanoparticle at Optical Frequencies

Sona Nerkararyan, Arsen Babajanyan, Khachatur Nerkararyan

Conference

Microwave Characterization of Complex Dielectric Permittivity Dependence on Glucose Concentration in Blood Serum and Aqueous Solution

Babajanyan A., Lee K., Kim S., Kim J., Friedman B., Arakelyan Sh., Parsamyan H.

Conference

Label-Free Monitoring of HbA1C by Microwaves

Babajanyan A., Kim S., Kim J., Abrahamyan A., Friedman B., Lee K.

Conference

Detection of Nanometric Vibrations by Using Opto-Mechanical Sensor

Arsen Babajanyan, Tigran Abrahamyan, Shant Arakelyan, Khachatur Nerkararyan

Conference

Noninvasive In Vitro Monitoring of Hba1c with a Microwave Biosensor

Arsen Babajanyan, S. Kim, J. Kim, Shant Arakelyan, K. Lee, J.-H. Lee, B Friedman

Conference

Detecting Defects in Sub-Skin-Depth Metallic Layers by a Thermo-Elastic Sensor

Arsen Babajanyan, Shant Arakelyan, Hanju Lee, Kiejin Lee, Barry Friedman

Conference

Effect of Pentacene Deposition Rate on OTFT

Arsen Babajanyan, Jinho Hwang, Duri Kim, Meenwoo Kim, Levon Odabashyan, Zhirayr Baghdasaryan, Seungwan Kim, Jongchel Kim, Hanju Lee, Kiejin Lee, Deokjoon Cha

Conference

Characterization of Heat Distribution and Microwave Absorption in a Carbon Composite Material by a Thermo-Elastic Optical Indicator Microscope

Aarsen Babajanyan, Zhirayr Baghdasaryan, Levon Odabashyan, Hanju Lee, Seungwan Kim, Jongchel Kim, Jinho Hwang, Duri Kim, Meenwoo Kim, Deokjoon Cha, Kiejin Lee

Conference

Real-Time Noninvasive Measurement of Glucose Concentration Using a Modified Hilbert

Shaped Microwave Fractal Sensor

Arsen Babajanyan, Levon Odabashyan, Zhirayr Baghdasaryan, Seungwan Kim, Jongchel Kim, Jinho Hwang, Meenwoo Kim, Hanju Lee, Deokjoon Cha, Kiejin Lee, Duri Kim

Conference

3D visualization of electromagnetic fields and thermal distribution by the thermo-elastic optical indicator microscope

A. Babajanyan, K. Lee, Zh. Baghdasaryan, L. Odabashyan, S. Kim, J. Kim, Gerard Berthiau, B. Friedman

Conference

Noninvasive in-vitro monitoring of D-glucose concentration by using a microwave fractal sensor

A. Babajanyan, L. Odabashyan, Zh. Baghdasaryan, T. Abrahamyan, N. Harutyunyan, S. Kim, J. Kim, B. Friedman, K. Lee

Conference

Sensing of silver nanoparticles in aqueous solutions by using an optical fiber probe-tip

A. Babajanyan, T. Abrahamyan, R. Khachatryan, Kh. Nerkararyan

Conference

Characterization of Ag nanoparticles concentration in aqueous solution by microwave biosensor

Arsen Babajanyan, Zh. Baghdasaryan, T. Abrahamyan, L. Odabashyan, H. Lee, D. Kim, M. Kim, S. Kim, K. Lee

Conference

Microwave and Joule heating visualization by a thermo-elastic sensor for carbon composite materials

Shant Arakelyan, Arsen Babajanyan, Gerard Berthiau, Barry Friedman, Kiejin Lee

Conference

Detecting Low Dose of Glucose in the Microwave Range By Using Thermoelastic Optical Indicator Microscope

Tigran Abrahamyan, Nelli Babajanyan, David Hambaryan, Hasmik Manukyan, Arsen Babajanyan, Kiejin Lee

Conference

Dielectric-Coated Conductive Rod Resonantly Coupled with a Cut Goubau Line as a Sensitive Microwave Sensor

Tigran Abrahamyan, Hovhannes Haroyan, David Hambaryan, Artyom Movsisy, Henrik Parsamyan, Arsen Babajanyan, Khachatur Nerkararyan, Kiejin Lee
