

# Armenuhi Gevorg Ghazaryan

## Research Institute of Physics

Leading researcher

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## Education

<b>Institution</b>	Yerevan State University
<b>Faculty</b>	Department of physics/ theoretical physics
<b>Date</b>	1992 - 1997
<b>Degree name</b>	PhD student

<b>Institution</b>	Yerevan State University
<b>Faculty</b>	Department of physics/ theoretical physics
<b>Date</b>	1987 - 1992
<b>Degree name</b>	Qualified specialist

## Scientific Rank/degree

<b>Institution</b>	Yerevan State University
<b>Date</b>	2015
<b>Degree name</b>	Doctor
<b>Specialty</b>	Physico-mathematical sciences
<b>Research Topic</b>	Research of some atomic and plasma phenomena in strong laser fields

## Language skills

English Русский Հայերեն

## Work experience

<b>Institution</b>	Yerevan State University, Institute of Physics, Centre of Strong Fields Physics
<b>Period of time</b>	1992 till now
<b>Rank/degree</b>	Leading Research Associate

## Scientific interests

- plasma physics with relativistic classical and quantum theories of multiphoton processes, theoretical aspects of above-threshold ionization of atoms, and high harmonic generation in atomic systems, and graphene physics

## Participation in international conferences and seminars

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<b>07/09/2025 - 12/09/2025</b>	2025 IEEE 15th on “Nanomaterials: Applications & Properties” Institute of Electrical Engineering at the Slovak Academy of Sciences Slovakia
<b>01/09/2025 - 05/09/2025</b>	Flatlands Beyond Graphene 2025 Politecnico di Milano Italy
<b>25/06/2025 - 28/06/2025</b>	The International 15th edition of Graphene Conference series (Graphene2025) San Sebastian University Spain
<b>30/10/2023 - 31/10/2023</b>	International Conference on Nanotechnology, Optoelectronics and Photonics World Academy of Science, Engineering and Technology United States of America (the)
<b>25/07/2022 - 27/07/2022</b>	MNs-22 —2nd International Conference Materials and Nanomaterials Rome University Italy
<b>04/10/2021 - 07/10/2021</b>	6th International Conference “Nanotechnology” dedicated to the memory of Prof. Alex Gerasimov, Nano21 Georgian Technical University, Tbilisi Georgia
<b>30/10/2023 - 08/11/2023</b>	Collaboration in frames of the project Max Planck Institute for Nuclear Physics, Heidelberg Germany
<b>25/09/2023 - 29/09/2023</b>	Flatlands beyond graphene 2023 University of Chemistry and Technology, Prague Czech Republic (the)

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## Publications

*Article*

**Elliptically Polarized High Laser Harmonics in the Hexagonal Graphene Quantum Dot  
[Эллиптически поляризованные высокие лазерные гармоники в гексагональной графеновой квантовой точке]**

A. G. Ghazaryan, N. O. Arustamyan, G. H. Chopuryan, Kh. V. Sedrakyan

Известия НАН РА. Физика (Journal of Contemporary Physics (Armenian Academy of Sciences) 2025  
160-165

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*Article*

**Optical anisotropy of high-order harmonic generation by strong laser radiation in rectangular**

## **graphene quantum dot**

Armenuhi G. Ghazaryan, Suren V. Sukiasyan, Khachik V. Sedrakian

Journal of Nanophotonics 2024 046002

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### *Article*

#### **Интенсивная генерация высших гармоник в молекуле фуллерена C180 (INTENSE HIGH HARMONIC GENERATION IN FULLERENE MOLECULE C180)**

Аветисян Г.К., Казарян А.Г., Матевосян Г.Г., Мкртчян Г.Ф.

Журнал экспериментальной и теоретической физики (Journal of Experimental and Theoretical Physics)

2024 25-31

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### *Article*

#### **Multiphoton excitation and high harmonic generation in rectangular graphene quantum dot**

A. G. Ghazaryan, Kh. V. Sedrakian, G. A. Musayelyan, T. M. Markosyan

Physica Scripta 2023 055921/13

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### *Article*

#### **ГЕНЕРАЦИЯ ВЫСШИХ ГАРМОНИК С УЧЕТОМ МНОГОЧАСТИЧНОГО КУЛОНОВСКОГО ВЗАИМОДЕЙСТВИЯ В ГРАФЕНОВОЙ КВАНТОВОЙ ТОЧКЕ**

Х. В. Седракян, А. Г. Казарян, Б. Р. Авчян, Г. А. Мусаелян, Т. М. Маркосян

Журнал экспериментальной и теоретической физики (Journal of Experimental and Theoretical Physics)

2023 56-65

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### *Article*

#### **High Harmonic Generation with Many-Particle Coulomb Interaction in Graphene Quantum Dot**

Kh. V. Sedrakian, A. G. Ghazaryan, B. R. Avchyan, G. A. Musayelyan, T. M. Markosyan

Журнал экспериментальной и теоретической физики (Journal of Experimental and Theoretical Physics)

2023 47-54

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### *Article*

#### **ГАРМОНИКИ ВЫСШЕГО ПОРЯДКА В ГЕКСАГОНАЛЬНЫХ ГРАФЕНОВЫХ КВАНТОВЫХ ТОЧКАХ**

Х.В. Седракян, А. Г. Казарян, Б. Р. Авчян, К.С. Погосян, Т.М. Маркосян

Журнал экспериментальной и теоретической физики (Journal of Experimental and Theoretical Physics)

2023 457-466

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### *Article*

#### **Higher-Order Harmonics in Hexagonal Graphene Quantum Dots**

Kh. V. Sedrakian, A. G. Ghazaryan, B. R. Avchyan, Q. S. Poghosyan, T. M. Markosyan

Journal of Experimental and Theoretical Physics 2023 395-403

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### *Article*

#### **Long-range correlation-induced effects at high-order harmonic generation on graphene quantum dots**

H. K. Avetissian, A. G. Ghazaryan, Kh. V. Sedrakian, G. F. Mkrтчian

Physical Review B 2023 165410

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*Article*

**Генерация высоких гармоник в треугольных квантовых графеновых точках**

Б. Р. Авчян, А. Г. Казарян, К. А. Саргсян, Х. В. Седракян

Журнал экспериментальной и теоретической физики (Journal of Experimental and Theoretical Physics)  
2022 155-165

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*Article*

**High Harmonic Generation in Triangular Graphene Quantum Dots**

B. R. Avchyan, A. G. Ghazaryan, K. A. Sargsyan, Kh. V. Sedrakyan

Journal of Experimental and Theoretical Physics 2022 125-134

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*Article*

**High harmonic generation with many-body Coulomb interaction in rectangular graphene quantum dots of armchair edge**

Babken R. Avchyan, Armenuhi G. Ghazaryan, Samvel S. Israelyan, Khachik V. Sedrakian

Journal of Nanophotonics 2022 036001: 1-12

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*Article*

**On Laser-Induced High-Order Wave Mixing and Harmonic Generation in a Graphene Quantum Dot**

B. R. Avchyan, A. G. Ghazaryan, K. A. Sargsyan, Kh. V. Sedrakian

JETP Letters 2022 428-435

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*Article*

**О лазерно-индуцированной генерации высших гармоник и смещении волн высокого порядка в графеновой квантовой точке**

Авчян Б. Р., Казарян А. Г., Саргсян К.А., Седракян Х. В.

Письма в Журнал экспериментальной и теоретической физики (Journal of Experimental and Theoretical Physics Letters)  
2022 426-433

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*Article*

**Higher harmonic generation of coherent sub-THz radiation at Lifshitz transition in gapped bilayer graphene**

Ghazaryan A. G.

Журнал экспериментальной и теоретической физики (Journal of Experimental and Theoretical Physics)  
2021 843-851

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*Article*

**ГЕНЕРАЦИЯ ВЫСШИХ ГАРМОНИК КОГЕРЕНТНОГО СУБТЕРАГЕРЦЕВОГО ИЗЛУЧЕНИЯ ПРИ ПЕРЕХОДЕ ЛИФШИЦА В ДВУХСЛОЙНОМ ГРАФЕНЕ СО ЩЕЛЬЮ**

А. Г. Казарян

Журнал экспериментальной и теоретической физики (Journal of Experimental and Theoretical Physics)  
2021 952-962

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*Article*

**High harmonic generation in fullerene molecules**

H. K. Avetissian, A. G. Ghazaryan, G. F. Mkrtchian  
Physical Review B 2021 125436

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*Article*

**ОТКЛИК ВЫСШИХ ГАРМОНИК ИНТЕНСИВНОГО КОГЕРЕНТНОГО ЭЛЕКТРОМАГНИТНОГО ПОЛЯ НА ИЗМЕНЕНИЕ ТОПОЛОГИИ ПОВЕРХНОСТИ ФЕРМИ В ГРАФЕНОПОДОБНЫХ НАНОСИСТЕМАХ**

Авчян Б. Р., Казарян А. Г., Саргсян К. А., Седракиян Х. В.

Журнал экспериментальной и теоретической физики (Journal of Experimental and Theoretical Physics)  
2021 1003-1012

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*Article*

**Fermi Surface Topology Signature on the High Harmonics Generation in Graphene-Like Nanostructure**

B. R. Avchyan, A. G. Ghazaryan, K. A. Sargsyan, Kh. V. Sedrakian

Журнал экспериментальной и теоретической физики (Journal of Experimental and Theoretical Physics)  
2021 883-891

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*Article*

**High-harmonic generation at particle-hole multiphoton excitation in gapped bilayer graphene**

Hamlet K. Avetissian, Ara K. Avetissian, Armenuhi G. Ghazaryan, Garnik F. Mkrtchian,

Khachik V. Sedrakian

Journal of Nanophotonics 2020 026004(1-15)

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*Article*

**High harmonics generation in bilayer graphene at high Fermi energies induced by coherent THz-radiation**

Armenuhi G. Ghazaryan, Hrant H. Matevosyan, Khachik V. Sedrakian

Journal of Nanophotonics 2020 046009(1-15)

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*Article*

**X-ray absorption via electron-ion bremsstrahlung in Maxwellian plasma at the exact consideration of Coulomb potential**

A G Ghazaryan

Laser Physics Letters 2019 066002(1-5)

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*Article*

**К ВКЛАДУ ДАЛЬНОДЕЙСТВУЮЩЕГО РАССЕЙВАЮЩЕГО ПОТЕНЦИАЛА В ПРОЦЕССЕ МНОГОФОТОННОЙ НАДПороГОВОЙ ИОНИЗАЦИИ АТОМОВ В ЛАЗЕРНОМ ПОЛЕ**

А. Г. Казарян

Журнал экспериментальной и теоретической физики (Journal of Experimental and Theoretical Physics)  
2019 602-611

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*Article*

**On the Contribution of the Long-Range Scattering Potential in the Process of Multiphoton Above-Threshold Ionization of Atoms in the Laser Field**

A. G. Ghazaryan

*Article*

**Third harmonic generation in gapped bilayer graphene**

Ara Karapet Avetissian, Armenuhi Gevorg Ghazaryan, Khachik Vazgen Sedrakian

Journal of Nanophotonics 2019 036010(1-13)

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*Article*

**Microscopic nonlinear quantum theory of absorption of coherent electromagnetic radiation in doped bilayer graphene**

Armenuhi G. Ghazaryan, Khachik V. Sedrakian

Journal of Nanophotonics 2019 046008(1-14)

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*Article*

**Multiphoton cross sections of conductive electrons stimulated bremsstrahlung in doped bilayer graphene**

Armenuhi G. Ghazaryan, Khachik V. Sedrakian

Journal of Nanophotonics 2019 046004(1-14)

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*Article*

**Microscopic nonlinear quantum theory of absorption of strong electromagnetic radiation in doped graphene**

Ara Karapet Avetissian, Armenuhi Gevorg Ghazaryan, Khachik Vazgen Sedrakian,

Babken Ruben Avchyan

Journal of Nanophotonics 2018 016006/12

<https://spie.org/publications/journals/journal-of-nanophotonics>

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*Article*

**High harmonic generation in Landau-quantized graphene subjected to a strong electromagnetic radiation**

Hamlet K. Avetissian, Armenuhi G. Ghazaryan, Garnik F. Mkrtchian, Khachik V. Sedrakian

Journal of Nanophotonics 2017 016004: 1- 9

<https://spie.org/publications/journals/journal-of-nanophotonics>

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*Article*

**Induced nonlinear cross sections of conductive electrons scattering on the charged impurities in doped graphene**

Avetissian Ara K., Ghazaryan Armenuhi G., Sedrakian Khachik V., Avchyan Babken R.

Journal of Nanophotonics 2017 036004: 1-12

<https://spie.org/publications/journals/journal-of-nanophotonics>

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*Article*

**Nonlinear absorption of high-intensity x-ray radiation in ultradense plasma**

H.K. Avetissian, A.K. Avetissian, A.G. Ghazaryan, H.H. Matevosyan, G.F. Mkrtchian

News and Reports from High Energy Density generated by Heavy Ion and Laser Beams 2015 2016 t<sub>2</sub> -78

[https://repository.gsi.de/record/194814/files/HEDP\\_report\\_\\_2k15\\_web-version.pdf](https://repository.gsi.de/record/194814/files/HEDP_report__2k15_web-version.pdf)

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*Article*

**Microscopic nonlinear relativistic quantum theory of absorption of powerful x-ray radiation in plasma**

H. K. Avetissian, A. G. Ghazaryan, H. H. Matevosyan, G. F. Mkrtchian

Physical Review E 2015 043103/8

<https://journals.aps.org/pre/>

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*Article*

**TREATMENT OF THE PLASMA NONLINEAR ABSORPTION LAW AT LINEARLY POLARIZED LASER RADIATION OF RELATIVISTIC INTENSITIES**

A. G. Ghazaryan

Armenian Journal of Physics 2015 64-72

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

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*Conference*

**Nonlinear Absorption of Superintense Linearly Polarized Laser Radiation in Relativistic Plasma via Bremsstrahlung**

A. K. Avetissian, A. G. Ghazaryan, S. S. Israelyan, Kh. V. Sedrakian

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*Conference*

**X-ray Absorption via Electron-ion SB in Maxwellian Plasma at the Exact Consideration of Coulomb Potential**

H.K. Avetissian, A.K. Avetissian, A.G. Ghazaryan, G.F. Mkrtchian

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*Conference*

**Landau-quantized graphene in strong radiation field and high harmonic generation**

H.K. Avetissian, A.G. Ghazaryan, G.F. Mkrtchian, Kh.V. Sedrakian

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*Conference*

**Nonlinear Absorption of Superstrong Linearly Polarized Laser Radiation in Plasma owing to Inverse Bremsstrahlung on Coulomb Centers**

A.G. Ghazaryan

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*Conference*

**Radiation Induced Nonlinear Cross Sections of Conductive Electrons Scattering on Charged Impurities in Doped Graphene**

A.K. Avetissian, B.R. Avchyan, A.G. Ghazaryan, Kh.V. Sedrakian

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*Conference*

**Nonlinear Absorption Coefficient of Doped Graphene at Conductive Electrons Scattering on Charged Impurities**

A.G. Ghazaryan, B.R. Avchyan, H.H. Matevosyan, Kh.V. Sedrakian

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*Conference*

**Impact of Coulomb collisions on laser-plasma interaction processes at high densities and relativistic intensities**

Ghazaryan A.G., Israelyan S.S., Matevosyan H.H., Sedrakian Kh.V.

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*Conference*

**Impact of Electron-ion Coulomb Interaction in Above Threshold Ionization of Atom in Strong Medium Infrared Laser Field**

Avetissian A.K., Ghazaryan A.G., Sedrakian Kh.V., Avchyan B.R.

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Conference

**Nonlinear Absorption Coefficient of Doped Graphene by Conductive Electrons Scattering on Charged Impurities**

A.K. Avetissian, A.G. Ghazaryan, Kh.V. Sedrakian

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Conference

**Radiation induced nonlinear cross sections of conductive electrons scattering on charged impurities in bilayer graphene**

A. K. Avetissian, B. R. Avchyan, A. G. Ghazaryan, Kh. V. Sedrakian

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Conference

**X-ray Absorption in Plasma by One-photon Stimulated Bremsstrahlung with the Exact Consideration of Coulomb potential**

A.K. Avetissian, A.G. Ghazaryan, Kh.V. Sedrakyan

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Conference

**Third Order Harmonic Generation in Gapped Bilayer Graphene**

A. K. Avetissian, A. G. Ghazaryan, Kh.V. Sedrakyan

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Conference

**High-Harmonic Generation in Bilayer Graphene with an Electric Field Induced Band Gap**

A. K. Avetissian, B. R. Avchyan, A. G. Ghazaryan, Kh. V. Sedrakyan

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Conference

**Microscopic nonlinear quantum theory of strong electromagnetic radiation absorption in doped bilayer graphene**

A. G. Ghazaryan, Kh. V. Sedrakian

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Conference

**Higher Harmonic Generation in AB Stacked Bilayer Graphene**

A. G. Ghazaryan, Kh. V. Sedrakian

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Conference

**High harmonic generation in plane graphene quantum dots with different shapes and edges**

B. R. Avchyan, K. A. Sargsyan, A. G. Ghazaryan, Kh. V. Sedrakian

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Conference

**High harmonic generation at particle-hole multiphoton excitation in gapped bilayer graphene**

H. Avetissian, A. Avetissian, A. Ghazaryan, G. Mkrtchian, Kh. Sedrakian

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Conference

**Harmonic generation at low-energy particle-hole excitation in bilayer graphene**

Armenuhi Ghazaryan, Hrant Matevosyan, Khachik Sedrakian

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Conference

**High harmonic generation on graphene quantum dots with collective scattering of electrons**

B. Avchyan, A. Ghazaryan, S. Israelyan, Kh. Sedrakian

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Conference

**Laser induced high-order wave mixing and multiparticle interaction in graphene quantum dots**

A.G. Ghazaryan, H.H. Matevosyan, Kh.V. Sedrakian

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*Conference*

**Optical anisotropy of high-order harmonic generation in rectangular graphene quantum dots**

B. R. Avchyan, A. G. Ghazaryan, Q. S. Poghosyan, Kh. V. Sedrakian

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*Conference*

**HIGH HARMONIC GENERATION BY STRONG LASER RADIATION IN FULLERENE MOLECULE C180**

H. K. Avetissian, A. G. Ghazaryan, H. H. Matevosyan, G. F. Mkrtchian

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*Conference*

**High-order Harmonic Generation in the Giant Fullerene Molecules**

H. K. Avetissian, A. G. Ghazaryan, H. H. Matevosyan, G. F. Mkrtchian

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*Conference*

**Elliptically Polarized High-order Laser Harmonics in Hexagonal Graphene Quantum Dots**

A. G. Ghazaryan, N. O. Arustamyan, G. H. Chopuryan, Kh. V. Sedrakian

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*Conference*

**High-Order Harmonics Generation in Graphene Quantum Dots by Bichromatic Laser Fields of Circular Polarization**

Kh. V. Sedrakian, H. K. Avetissian, A. G. Ghazaryan, G. F. Mkrtchian

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*Conference*

**High Harmonic Generation in Graphene Quantum Dots with Laser Fields of Elliptic Polarization**

A G. Ghazaryan, H. H. Matevosyan, N. O. Arustamyan, T. M. Markosyan, Kh. V. Sedrakian

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*Conference*

**High Harmonic Generation and Wave Mixing in Graphene Quantum Dots by Bichromatic Laser Fields of Circular Polarization**

H. K. Avetissian, A. G. Ghazaryan, G. F. Mkrtchian, Kh. V. Sedrakian

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*Conference*

**Symmetrically driven enhancement of high harmonic generation in graphene quantum dots**

Armenuhi Gevorg Ghazaryan, Hamlet Karo Avetissian, Garnik Felix Mkrtchian, Khachik Vazgen Sedrakian

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