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International Researcher IDs

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Education Information

Post Doctorate, Ohio State University, Electrical And Computer Engineering, United States Of America 2016 - 2017

Doctorate, Ohio State University, Electrical And Computer Engineering, United States Of America 2011 - 2016

Postgraduate, Ohio State University, Electrical And Computer Engineering, United States Of America 2009 - 2011

Undergraduate, Gaziantep University, Elektrik - Elektronik Muh., Turkey 2003 - 2008

Foreign Languages

German, A1 Beginner

English, C1 Advanced

Dissertations

Doctorate, Nanoscale Electron Transport Engineering for GaN Optoelectronic Devices, Ohio State University, Electrical And Computer Engineering, Faculty Of Engineering, 2016

Postgraduate, N-Polar III-Nitride Optoelectronic Devices, Ohio State University, Electrical And Computer Engineering, Faculty Of Engineering, 2011

Research Areas

Electrical and Electronics Engineering, Optoelectronic Materials and Devices, Semiconducting Materials and Devices, Nanomaterials, Engineering and Technology

Academic Titles / Tasks

Assistant Professor, Yildiz Technical University, Faculty Of Chemical And Metallurgical Engineering, Department Of Metallurgical And Materials Engineering, 2018 - Continues

Published journal articles indexed by SCI, SSCI, and AHCI

- I. **Close oxygen coupled low-pressure chemical vapor deposition growth of high quality beta - Ga₂O₃ on sapphire**
AKYOL F., DEMİR İ.
MATERIALS SCIENCE IN SEMICONDUCTOR PROCESSING, vol.146, 2022 (SCI-Expanded)
- II. **Simulation of beta-Ga₂O₃ vertical Schottky diode based photodetectors revealing average hole mobility of 20cm²V⁽⁻¹⁾s⁽⁻¹⁾**
AKYOL F.
JOURNAL OF APPLIED PHYSICS, vol.127, no.7, 2020 (SCI-Expanded)
- III. **Tunnel-injected sub 290 nm ultra-violet light emitting diodes with 2.8% external quantum efficiency**
Zhang Y., Jamal-Eddine Z., Akyol F., Bajaj S., Johnson J. M., Calderon G., ALLERMAN A. A., MOSELEY M. W., ARMSTRONG A. M., Hwang J., et al.
APPLIED PHYSICS LETTERS, vol.112, no.7, 2018 (SCI-Expanded)
- IV. **High Al-Content AlGa_N Transistor With 0.5 A/mm Current Density and Lateral Breakdown Field Exceeding 3.6 MV/cm**
Bajaj S., ALLERMAN A., ARMSTRONG A., Razzak T., Talesara V., Sun W., Soheli S. H., Zhang Y., Lu W., Arehart A. R., et al.
IEEE ELECTRON DEVICE LETTERS, vol.39, no.2, pp.256-259, 2018 (SCI-Expanded)
- V. **Ultralow-voltage-drop GaN/InGa_N/GaN tunnel junctions with 12% indium content**
Akyol F., Zhang Y., Krishnamoorthy S., Rajan S.
APPLIED PHYSICS EXPRESS, vol.10, no.12, 2017 (SCI-Expanded)
- VI. **Graded AlGa_N Channel Transistors for Improved Current and Power Gain Linearity**
Bajaj S., Yang Z., Akyol F., PARK P. S., Zhang Y., Price A. L., Krishnamoorthy S., MEYER D. J., Rajan S.
IEEE TRANSACTIONS ON ELECTRON DEVICES, vol.64, no.8, pp.3114-3119, 2017 (SCI-Expanded)
- VII. **Reflective metal/semiconductor tunnel junctions for hole injection in AlGa_N UV LEDs**
Zhang Y., Krishnamoorthy S., Akyol F., Johnson J. M., ALLERMAN A. A., MOSELEY M. W., ARMSTRONG A. M., Hwang J., Rajan S.
APPLIED PHYSICS LETTERS, vol.111, no.5, 2017 (SCI-Expanded)
- VIII. **Tunnel-injected sub-260nm ultraviolet light emitting diodes**
Zhang Y., Krishnamoorthy S., Akyol F., Bajaj S., ALLERMAN A. A., MOSELEY M. W., ARMSTRONG A. M., Rajan S.
APPLIED PHYSICS LETTERS, vol.110, no.20, 2017 (SCI-Expanded)
- IX. **Design of p-type cladding layers for tunnel-injected UV-A light emitting diodes**
Zhang Y., Krishnamoorthy S., Akyol F., ALLERMAN A. A., MOSELEY M. W., ARMSTRONG A. M., Rajan S.
APPLIED PHYSICS LETTERS, vol.109, no.19, 2016 (SCI-Expanded)
- X. **AlGa_N channel field effect transistors with graded heterostructure ohmic contacts**
Bajaj S., Akyol F., Krishnamoorthy S., Zhang Y., Rajan S.
APPLIED PHYSICS LETTERS, vol.109, no.13, 2016 (SCI-Expanded)
- XI. **Design and demonstration of ultra-wide bandgap AlGa_N tunnel junctions**
Zhang Y., Krishnamoorthy S., Akyol F., ALLERMAN A. A., MOSELEY M. W., ARMSTRONG A. M., Rajan S.
APPLIED PHYSICS LETTERS, vol.109, no.12, 2016 (SCI-Expanded)
- XII. **Enhanced light extraction in tunnel junction-enabled top emitting UV LEDs**
Zhang Y., ALLERMAN A. A., Krishnamoorthy S., Akyol F., MOSELEY M. W., ARMSTRONG A. M., Rajan S.
APPLIED PHYSICS EXPRESS, vol.9, no.5, 2016 (SCI-Expanded)
- XIII. **Low-resistance Ga_N tunnel homojunctions with 150 kA/cm² current and repeatable negative differential resistance**
Akyol F., Krishnamoorthy S., Zhang Y., Johnson J., Hwang J., Rajan S.
APPLIED PHYSICS LETTERS, vol.108, no.13, 2016 (SCI-Expanded)
- XIV. **Density-dependent electron transport and precise modeling of Ga_N high electron mobility transistors**
Bajaj S., Shorouf O. F., Park P. S., Krishnamoorthy S., Akyol F., Hung T., REZA S., CHUMBES E. M., Khurgin J., Rajan S.
APPLIED PHYSICS LETTERS, vol.107, no.15, 2015 (SCI-Expanded)

- XV. **GaN-based three-junction cascaded light-emitting diode with low-resistance InGaN tunnel junctions**
Akyol F., Krishnamoorthy S., Zhang Y., Rajan S.
APPLIED PHYSICS EXPRESS, vol.8, no.8, 2015 (SCI-Expanded)
- XVI. **Interband tunneling for hole injection in III-nitride ultraviolet emitters**
Zhang Y., Krishnamoorthy S., Johnson J. M., Akyol F., ALLERMAN A., MOSELEY M. W., ARMSTRONG A., Hwang J., Rajan S.
APPLIED PHYSICS LETTERS, vol.106, no.14, 2015 (SCI-Expanded)
- XVII. **InGaN/GaN tunnel junctions for hole injection in GaN light emitting diodes**
Krishnamoorthy S., Akyol F., Rajan S.
APPLIED PHYSICS LETTERS, vol.105, no.14, 2014 (SCI-Expanded)
- XVIII. **Tunneling-based carrier regeneration in cascaded GaN light emitting diodes to overcome efficiency droop**
Akyol F., Krishnamoorthy S., Rajan S.
APPLIED PHYSICS LETTERS, vol.103, no.8, 2013 (SCI-Expanded)
- XIX. **Low resistance GaN/InGaN/GaN tunnel junctions**
Krishnamoorthy S., Akyol F., Park P. S., Rajan S.
APPLIED PHYSICS LETTERS, vol.102, no.11, 2013 (SCI-Expanded)
- XX. **Polarization-engineered GaN/InGaN/GaN tunnel diodes**
Krishnamoorthy S., Nath D. N., Akyol F., Park P. S., Esposto M., Rajan S.
APPLIED PHYSICS LETTERS, vol.97, no.20, 2010 (SCI-Expanded)

Articles Published in Other Journals

- I. **Investigating the effect of self-trapped holes in the current gain mechanism of beta-Ga₂O₃ Schottky diode photodetectors**
AKYOL F.
TURKISH JOURNAL OF PHYSICS, vol.45, no.3, pp.169-177, 2021 (ESCI)

Books & Book Chapters

- I. **Gallium Nitride–Based Interband Tunnel Junctions**
AKYOL F.
in: Gallium Nitride (GaN) Physics, Devices, and Technology, Farid Medjdoub, Editor, Crc Press, Florida, Boca Raton, pp.299-326, 2017

Refereed Congress / Symposium Publications in Proceedings

- I. **Epitaxial Growth of Monoclinic Gallium Oxide (β -Ga₂O₃) Layers on 4H- Silicon Carbide (SiC)**
Özden H., AKYOL F.
International Marmara Sciences Congress 2022, Kocaeli, Turkey, 9 - 10 December 2022
- II. **Growth of single crystal Ga₂O₃ by customized low pressure chemical deposition**
AKYOL F.
Global conference on Material Sciences, İstanbul, Turkey, 30 October - 01 November 2020
- III. **Tunnel-injected ultraviolet light-emitting diodes (Conference Presentation)**
RAJAN S., ZHANG Y., JAMAL EDDIE Z., AKYOL F., HWANG J., JOHNSON J.
Gallium Nitride Materials and Devices XIII, San Francisco, United States, United States Of America, 27 January - 01 February 2018, vol.10532
- IV. **Small-Signal Characteristics of Graded AlGaN Channel PoLFETs**

- BAJAJ S., YANG Z., AKYOL F., PARK P. S., ZHANG Y., SOHEL S. H., KRISHNAMOORTHY S., MEYER D. J., RAJAN S.
2017 75TH ANNUAL DEVICE RESEARCH CONFERENCE (DRC), South Bend, 25 - 28 June 2017
- V. **Ultra-Wide Bandgap AlGa_N Channel MISFET with Polarization Engineered Ohmics**
BAJAJ S., AKYOL F., KRISHNAMOORTHY S., ZHANG Y., ARMSTRONG A., ALTERMAN A., RAJAN S.
2016 74TH ANNUAL DEVICE RESEARCH CONFERENCE (DRC), Newark, 19 - 22 June 2016
- VI. **Sub 300 nm Wavelength III-Nitride Tunnel-Injected Ultraviolet LEDs**
ZHANG Y., KRISHNAMOORTHY S., AKYOL F., KHANDAKER S., ALLERMAN A., MOSELEY M. W., ARMSTRONG A.,
RAJAN S.
2015 73RD ANNUAL DEVICE RESEARCH CONFERENCE (DRC), Columbus, 21 - 24 June 2015, pp.69-70
- VII. **Density-Dependent Electron Transport for Accurate Modeling of AlGa_N/Ga_N HEMTs**
BAJAJ S., SHORON O. F., PARK P. S., KRISHNAMOORTHY S., AKYOL F., HUNG T. H., REZA S., CHUMBES E. M., KHURGIN
J. B., RAJAN S.
2015 73RD ANNUAL DEVICE RESEARCH CONFERENCE (DRC), Columbus, 21 - 24 June 2015, pp.33-34
- VIII. **Power Switching Transistors Based on Ga_N and AlGa_N Channels**
Bajaj S., Hung T., Akyol F., Krishnamoorthy S., Khandaker S., ARMSTRONG A., ALLERMAN A., Rajan S.
3rd IEEE Workshop on Wide Bandgap Power Devices and Applications (WiPDA), Virginia, United States Of
America, 2 - 04 November 2015, pp.16-20
- IX. **III-nitride tunnel junctions for efficient solid state lighting**
Krishnamoorthy S., Akyol F., Rajan S.
Conference on Gallium Nitride Materials and Devices IX, San-Francisco, Costa Rica, 3 - 06 February 2014, vol.8986

Supported Projects

Akyol F., Demir I., TÜBİTAK - AB COST Project, European Network for Innovative and Advanced Epitaxy, 2021 - 2026
Akyol F., Demir İ., Gür E., TÜBİTAK Project, Ultra Geniş Bant Aralıklı Rutil-Geo₂ Tek Kristal Yapıların Düşük Basınçlı
Kimyasal Buhar Biriktirme Yöntemiyle Büyütülmesi Ve Karakterizasyonu, 2022 - 2025
Akyol F., TÜBİTAK Project, Monoklinik Galyum Oksit (β -Ga₂O₃) Tabakalarının 4h- Silisyum Karbür (SiC) Üzerine
Epitaksiyel Elde Edilmesi, 2021 - 2022
Akyol F., TÜBİTAK Project, Low Pressure Chemical Vapor Deposition of Ga₂O₃, 2019 - 2022

Patent

Akyol F., TUNNEL JUNCTION ULTRAVIOLET LIGHT EMITTING DIODES WITH ENHANCED LIGHT EXTRACTION
EFFICIENCY, Patent, CHAPTER H Electricity, The Invention Registration Number: WO 2018/204402 A1, Standard
Registration, 2018

Metrics

Publication: 31
Citation (WoS): 884
Citation (Scopus): 1023
H-Index (WoS): 17
H-Index (Scopus): 17