



Fisika



LPPM



Volume 9 Issue 3, December 2024

# SPEKTRA

Jurnal Fisika dan Aplikasinya



DOI: [doi.org/10.21009/SPEKTRA](https://doi.org/10.21009/SPEKTRA)

e-ISSN : 2541-3392

**SPEKTRA: Jurnal Fisika dan Aplikasinya**

Volume 9 Issue 3, December 2024

DOI: [doi.org/10.21009/SPEKTRA.093](https://doi.org/10.21009/SPEKTRA.093)

*SPEKTRA: Jurnal Fisika dan Aplikasinya* is dedicated to **researchers and practitioners** in the field of physics and focuses on publishing high-quality research in specific areas of physics and its applications. The journal covers instrumentation and computational physics, material physics, medical and biophysics, astrophysics, theoretical physics, particle and nuclear physics, environmental physics, renewable energy, and other related fields. By emphasizing these areas, *SPEKTRA* aims to provide a specialized platform for advancing knowledge and fostering innovation in physics.

*SPEKTRA: Jurnal Fisika dan Aplikasinya* is jointly published and managed by **LPPM Universitas Negeri Jakarta, Faculty of Mathematics and Natural Sciences Universitas Negeri Jakarta, Physics Department Universitas Negeri Jakarta**, and the **Physical Society of Indonesia (PSI)**, under collaboration agreements [B/70/UN39.5.FMIPA/HK.07.00/2022](#) and [017/PSI.06/2022](#). This collaboration reflects a strong commitment to supporting physics research and its practical applications.

*SPEKTRA* has been accredited by ARJUNA (Indonesia's National Journal Accreditation System) and awarded a [Sinta 3](#) rank.

**SPEKTRA: Jurnal Fisika dan Aplikasinya**

Volume 9 Issue 3, December 2024

**Laser-Assisted Scattering with Screened Diatomic Potential***Asmit Sapkota, Saddam Husain Dhobi, Subash Khatiwada***Phase Dynamics in 3D Superconductors: Analysis Using the Sine-Gordon***Kiran Khadka, Saddam Husain Dhobi, Kishori Yadav***Application of Variational Quantum Eigensolver for Ground State Energies Calculation in Hydrogen and Helium Atomic Sequences***Difa Farhani Hakim, Teguh Budi Prayitno, Yanoar Pribadi Sarwono***Geochemical and Magnetic Susceptibility Analysis for Critical Minerals Detection in Igneous Rocks and Beach Sand***Yensi Hariyanto, Siti Zulaikah, Cahyo Aji Hapsoro, Shofi Maulida, Hanif 'Izzudin Zakly, Nordiana Mohd Muztaza, Daeng Achmad Suadi, Aditya Pratama, Hamdi Hamdi***Seismometer Health Diagnosis Based on Cross Spectral Density Coherence Method in Indonesia Seismic Networks***Miftahul Jannah, Risa Annisa, Adhi Harmoko Saputro, Titik Lestari***The Effects of Stellar Wind, Rotation Velocity, and Overshoot Parameters on The Evolution of Massive Stars using MESA: Case Study of MPG 324, MPG 355, MPG 682***Alin Hafizhah Adira, Aprilia*



**Editor in Chief**

Widyaningrum Indrasari (Universitas Negeri Jakarta, Indonesia)

**Editors**

Janaka Adassuriya (University of Colombo, Sri Lanka)

Fumiyuki Ishii (Kanazawa University, Japan)

Md. Nizam Abd Rahman (Universiti Teknikal Malaysia Melaka, Malaysia)

Dwi Pebrianti (International Islamic University Malaysia, Malaysia)

Erfan Handoko (Universitas Negeri Jakarta, Indonesia)

Iwan Sugihartono (Universitas Negeri Jakarta, Indonesia)

Irzaman (Institut Pertanian Bogor, Indonesia)

Rahmondia Nanda Setiadi (Universitas Riau, Indonesia)

Masturi (Universitas Negeri Semarang, Indonesia)

Rahadi Wirawan (Universitas Mataram, Indonesia)

Andhy Setiawan (Universitas Pendidikan Indonesia, Indonesia)

**Editorial Office**

Program Studi Fisika Fakultas MIPA

Kampus A Universitas Negeri Jakarta

Gedung K.H. Hasyim Asyari Lt.10

Jalan Rawamangun Muka No.1

Rawamangun-Pulogadung Jakarta Timur, 13220

## Reviewers (Mitra Bebestari)

Hsiang-Lin Liu (National Taiwan Normal University, Taiwan)  
Yusaku Fujii (Gunma University, Japan)  
Idrus Husin Belfaqih (The University of Edinburgh, United Kingdom)  
Yayat Ruhiat (Universitas Sultan Ageng Tirtayasa, Indonesia)  
Md. Rahim Sahar (Universiti Teknologi Malaysia, Malaysia)  
Yohanes Edi Gunanto (Universitas Pelita Harapan, Indonesia)  
Ezza Syuhada Sazali (Universiti Teknologi Malaysia, Malaysia)  
Yulkifli (Universitas Negeri Padang, Indonesia)  
Fiber Monado (Universitas Sriwijaya, Indonesia)  
Zaroh Irayani (Universitas Jenderal Sudirman, Indonesia)  
Sparisoma Viridi (Institut Teknologi Bandung, Indonesia)  
Trismidianto (Pusat Sains dan Teknologi Atmosfer LAPAN, Indonesia)  
Lusi Safriani (Universitas Padjadjaran, Indonesia)  
Eleonora Agustine (Universitas Padjadjaran, Indonesia)  
Agus Supriyanto (Universitas Negeri Sebelas Maret, Indonesia)  
Syuhada (Lembaga Ilmu Pengetahuan Indonesia, Indonesia)  
Ganesha Antarnusa (Universitas Sultan Ageng Tirtayasa, Indonesia)  
Henni Sitompul (Universitas Pelita Harapan, Indonesia)  
Jenny Primanita Diningrum (Universitas Islam 45, Indonesia)  
Netta Liliani (Universitas Islam 45, Indonesia)  
Ni Larasati Kartika Sari (Universitas Nasional, Indonesia)  
S. Sofyan (Politeknik Negeri Ujung Pandang, Indonesia)  
Devi Taufiq Nurrohman (Politeknik Negeri Cilacap, Indonesia)  
Yanurita Dwi Hapsari (Institut Teknologi Sepuluh Nopember, Indonesia)

## EDITORIAL FOREWORD

SPEKTRA: Jurnal Fisika dan Aplikasinya is dedicated to all physics practitioners. The coverage of SPEKTRA includes Instrumentation and Computational Physics, Material Physics, Medical Physics and Biophysics, Astrophysics, Theoretical Physics, Particle, and Nuclear Physics, Environment Physics, Renewable Energy, and other fields related to the application of physics.

SPEKTRA Volume 9 issue 3 contains six papers: 1) Laser-Assisted Scattering with Screened Diatomic Potential, 2) Phase Dynamics in 3D Superconductors: Analysis Using the Sine-Gordon, 3) Application of Variational Quantum Eigensolver for Ground State Energies Calculation in Hydrogen and Helium Atomic Sequences, 4) Geochemical and Magnetic Susceptibility Analysis for Critical Minerals Detection in Igneous Rocks and Beach Sand, 5) Seismometer Health Diagnosis Based on Cross Spectral Density Coherence Method in Indonesia Seismic Networks, and 6) The Effects of Stellar Wind, Rotation Velocity, and Overshoot Parameters on The Evolution of Massive Stars using MESA: Case Study of MPG 324, MPG 355, MPG 682.

The articles in this issue from 4 countries: Indonesia, Nepal, New Zealand, and Malaysia. We are grateful for all the contributions of the authors. We also appreciate the professional reviewers who are an essential part of this issue.

Hopefully, SPEKTRA can be a reference for readers and researchers in developing physics and its application.

Jakarta, 30 December 2024

Editor-in-Chief,

Widyaningrum Indrasari



## CONTENTS

TITLE AND AUTHOR(S)	PAGES
<b>Laser-Assisted Scattering with Screened Diatomic Potential</b> <i>Asmit Sapkota, Saddam Husain Dhobi, Subash Khatiwada</i>	123-136
<b>Phase Dynamics in 3D Superconductors: Analysis Using the Sine-Gordon</b> <i>Kiran Khadka, Saddam Husain Dhobi, Kishori Yadav</i>	137-154
<b>Application of Variational Quantum Eigensolver for Ground State Energies Calculation in Hydrogen and Helium Atomic Sequences</b> <i>Difa Farhani Hakim, Teguh Budi Prayitno, Yanoar Pribadi Sarwono</i>	155-166
<b>Geochemical and Magnetic Suseptibility Analysis for Critical Minerals Detection in Igneous Rocks and Beach Sand</b> <i>Yensi Hariyanto, Siti Zulaikah, Cahyo Aji Hapsoro, Shofi Maulida, Hanif 'Izzudin Zakly, Nordiana Mohd Muztaza, Daeng Achmad Suadi, Aditya Pratama, Hamdi Hamdi</i>	167-178
<b>Seismometer Health Diagnosis Based on Cross Spectral Density Coherence Method in Indonesia Seismic Networks</b> <i>Miftahul Jannah, Risa Annisa, Adhi Harmoko Saputro, Titik Lestari</i>	179-188
<b>The Effects of Stellar Wind, Rotation Velocity, and Overshoot Parameters on The Evolution of Massive Stars using MESA: Case Study of MPG 324, MPG 355, MPG 682</b> <i>Alin Hafizhah Adira, Aprilia</i>	189-198

