

**LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW
KARYA ILMIAH : JURNAL ILMIAH**

Judul Karya Ilmiah (Artikel) : The role of metastable atoms in atomic excitation process of magnesium in microwave-assisted laser plasma

Jumlah Penulis : 4 Orang

Status Pengusul : Penulis pertama/ ~~Penulis ke-~~/ Penulis Korespondensi **

Identitas Jurnal Ilmiah : a. Nama Jurnal : Optics Communications
 b. Nomor ISSN : 0030-4018
 c. Volume, Nomor, Bulan, Tahun : Vol 479, No.-, Januari 2021
 d. Penerbit : Elsevier
 e. DOI artikel (jika ada) : 10.1016/j.optcom.2020.126457
 f. Alamat web jurnal : <https://www.sciencedirect.com/science/article/pii/S0030401820308750?via%3Dihub>
 g. Terindeks di Scimagojr/Scopus ~~atau~~ di... **

Kategori Publikasi Jurnal Ilmiah (beri pada kategori yang tepat) : ~~Jurnal Ilmiah Internasional~~ / Internasional Bereputasi **
 Jurnal Ilmiah Nasional Terakreditasi
 Jurnal Ilmiah Nasional/Nasional Terindeks di DOAJ, CABI, COPERNICUS**

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Reviewer		Nilai Rata-rata
	Reviewer I	Reviewer II	
a. Kelengkapan unsur isi jurnal (10%)	3.8	3.8	3.8
b. Ruang lingkup dan kedalaman pembahasan (30%)	11.8	11.7	11.75
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	11.7	11.6	11.65
d. Kelengkapan unsur dan kualitas penerbit (30%)	11.0	11.5	11.25
Total = (100%)	38,3	38,6	38,45
Nilai untuk Pengusul : 60% x 38.45 = 23.07			

Semarang, 5 Maret 2021

Reviewer 1



Prof. Dr. Suryono, S.Si., M.Si.

NIP. 197306301998021001

Bidang ilmu/Unit kerja : Fakultas Sains dan Matematika/Fisika

Reviewer 2



Dr. Eng. Eko Hidayanto, S.Si., M.Si.

NIP. 197301031998021001

Bidang ilmu/Unit kerja : Fakultas Sains dan Matematika/Fisika

**LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW
KARYA ILMIAH : JURNAL ILMIAH**

Judul Jurnal Ilmiah (Artikel) : The role of metastable atoms in atomic excitation process of magnesium in microwave-assisted laser plasma

Nama/ Jumlah Penulis : 4 Orang

Status Pengusul : Penulis pertama/ Penulis ke / Penulis Korespondensi **

Identitas Jurnal Ilmiah :

a. Nama Jurnal : Optics Communications

b. Nomor ISSN : 0030-4018

c. Vol, No., Bln Thn : Vol 479, Januari 2021

d. Penerbit : Elsevier

e. DOI artikel (jika ada) : 10.1016/j.optcom.2020.126457

f. Alamat web jurnal : <https://www.sciencedirect.com/science/article/abs/pii/S030401820308750?via%3Dihub>

Alamat Artikel : <https://reader.elsevier.com/reader/sd/pii/S0030401820308750?token=600679BFD541AB824482A4C70DA0A99421F01B0184DAFD0647B04A7B43F31EAB1F9A2E334044490521D498F9CDD3D635&originRegion=eu-west-1&originCreation=20210803045521>

g. Terindex : Scopus

Kategori Publikasi Jurnal Ilmiah (beri pada kategori yang tepat) :

Jurnal Ilmiah Internasional/Internasional Bereputasi

Jurnal Ilmiah Nasional Terakreditasi Jurnal Ilmiah

Nasional Tidak Terakreditasi

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Jurnal Ilmiah			Nilai Akhir Yang Diperoleh
	Internasional	Nasional Terakreditasi	Nasional Tidak Terakreditasi	
a. Kelengkapan unsur isi jurnal (10%)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3,8
b. Ruang lingkup dan kedalaman pembahasan (30%)	12			11,8
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	12			11,7
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	12			11,0
Total = (100%)	40			38,3
Nilai Pengusul = 60% x 38,3 = 22,98				

Catatan Penilaian artikel oleh Reviewer :

1. Kesesuaian dan kelengkapan unsur isi jurnal:

Jurnal telah memiliki kesesuaian antar bagian, memiliki gap riset yang jelas, jurnal ditulis dengan lengkap dan memenuhi unsur-unsur penulisan jurnal yang baik.

2. Ruang lingkup dan kedalaman pembahasan:

Jurnal memiliki ruang lingkup yang spesifik dan jelas, pembahasan telah didukung dengan literatur terkini dan memiliki kedalaman yang baik sesuai dengan hasil yang diperoleh.

3. Kecukupan dan kemutakhiran data/informasi dan metodologi:

Jurnal memiliki kecukupan data yang memadai yang diperoleh dari instrumen yang baik, menggunakan metodologi riset yang telah sesuai yang didukung dengan referensi jurnal terbaru, sebaiknya dikurangi referensi jurnal yang lebih dari 5 tahun terakhir, isi jurnal memiliki kejelasan keaslian.

4. Kelengkapan unsur dan kualitas terbitan:

Jurnal telah memiliki kelengkapan unsur yang baik dan kualitas terbitan yang sangat baik dari penerbit Elsevier, jurnal yang terindeks scopus, dan memiliki indeks similaritas yang kecil.

Semarang, 20 April 2021

Reviewer 1



Prof. Dr. Suryono, S.Si., M.Si.

NIP. 197306301998021001

Unit Kerja : Fisika

Bidang Ilmu: Fakultas Sains dan Matematika

**LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW
KARYA ILMIAH : JURNAL ILMIAH**

Judul Jurnal Ilmiah (Artikel) : The role of metastable atoms in atomic excitation process of magnesium in microwave-assisted laser plasma

Nama/ Jumlah Penulis : 4 Orang

Status Pengusul : Penulis pertama/ Penulis ke / Penulis Korespondensi-**

Identitas Jurnal Ilmiah :

- a. Nama Jurnal : Optics Communications
- b. Nomor ISSN : 0030-4018
- c. Vol, No., Bln Thn : Vol 479, Januari 2021
- d. Penerbit : Elsevier
- e. DOI artikel (jika ada) : 10.1016/j.optcom.2020.126457
- f. Alamat web jurnal : <https://www.sciencedirect.com/science/article/pii/S0030401820308750?via%3Dihub>
- Alamat Artikel : <https://reader.elsevier.com/reader/sd/pii/S0030401820308750?token=600679BFD541AB824482A4C70DA0A99421F01B0184DAFD0647B04A7B43F31EAB1F9A2E334044490521D498F9CDD3D635&originRegion=eu-west-1&originCreation=20210803045521>
- g. Terindex : Scopus

Kategori Publikasi Jurnal Ilmiah (beri pada kategori yang tepat) :

<input checked="" type="checkbox"/>	Jurnal Ilmiah Internasional/Internasional Bereputasi
<input type="checkbox"/>	Jurnal Ilmiah Nasional Terakreditasi Jurnal Ilmiah
<input type="checkbox"/>	Nasional Tidak Terakreditasi

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Jurnal Ilmiah			Nilai Akhir Yang Diperoleh
	Internasional	Nasional Terakreditasi	Nasional Tidak Terakreditasi	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
a. Kelengkapan unsur isi jurnal (10%)	4			3,8
b. Ruang lingkup dan kedalaman pembahasan (30%)	12			11,7
c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)	12			11,6
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	12			11,5
Total = (100%)	40			38,6
Nilai Pengusul = 60% x 38,6 = 23,16				

Catatan Penilaian artikel oleh Reviewer :

1. Kesesuaian dan kelengkapan unsur isi jurnal:

Sangat sesuai dan lengkap mulai dari abstrak, pendahuluan, prosedur eksperimen, hasil dan pembahasan, sampai pada kesimpulan dan daftar pustaka yang digunakan.

2. Ruang lingkup dan kedalaman pembahasan:

Paper ini membahas tentang proses eksitasi atom magnesium telah dilakukan dalam plasma laser gelombang mikro, dengan pembahasan yang baik bahwa intensitas emisi dari garis magnesium ionik memiliki energi eksitasi relatif rendah sekitar 4 eV.

3. Kecukupan dan kemutakhiran data/informasi dan metodologi:

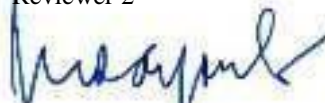
Data-data hasil yang diperoleh dalam penelitian mutakhir dengan didukung metodologi yang tepat.

4. Kelengkapan unsur dan kualitas terbitan:

Karya ini diterbitkan dalam jurnal berkualitas Q2 dengan SJR 0,63 oleh Elsevier dengan unsur-unsur yang lengkap serta kualitas yang sangat baik.

Semarang, 02 Juli 2021

Reviewer 2



Dr. Eng. Eko Hidayanto, S.Si., M.Si.

NIP. 197301031998021001

Unit Kerja : Fisika

Bidang Ilmu: Fakultas Sains dan Matematika



1 of 1

Export Download Print E-mail Save to PDF Add to List More... >

View at Publisher|

Document type

Article

Source type

Journal

ISSN

00304018

DOI

10.1016/j.optcom.2020.126457

View more ▾

Optics Communications • Volume 479 • 15 January 2021 • Article number 126457

The role of metastable atoms in atomic excitation process of magnesium in microwave-assisted laser plasma

Khumaeni A.^a ✉, Akaoka K.^b, Miyabe M.^b, Wakaida I.^b

Save all to author list

^a Department of Physics, Faculty of Science and Mathematics, Diponegoro University, Semarang, 50275, Tembalang, Indonesia

^b Remote Analytical Technology Group, Collaborative Laboratory for Advanced Decommissioning Science, Japan Atomic Energy Agency, Shirakata 2-4, Ibaraki-ken, 319-1195, Tokai-mura, Naka-gun, Japan

1

Citation in Scopus

33

Views count ⓘ

View all metrics >

Cited by 1 document

The parameter optimization of lasers' energy ratio of the double-pulse laser induced breakdown spectrometry for heavy metal elements in the soil

Chen, G. , Yang, G. , Ling, Z. (2021) *Analytical Methods*

View details of this citation

Inform me when this document is cited in Scopus:

Set citation alert >

Related documents

Find more related documents in Scopus based on:

Authors > Keywords >

Abstract

Author keywords

Reaxys Chemistry database information

Indexed keywords

SciVal Topics

Metrics

Funding details

Abstract



Optics Communications

Supports open access

4.4

CiteScore

2.310


Impact Factor

Articles & Issues ▾

About ▾

Publish ▾

 Search in this journal

Submit your
article 

Guide for
authors 

Latest issue

Volume 500

In progress

1 December 2021

About the journal

Optics Communications invites original and timely contributions containing new results in various fields of optics and photonics. The journal considers theoretical and experimental research in areas ranging from the fundamental properties of light to technological applications. Topics covered ...

[Read more](#)

Editorial Board



Editor-in-Chief

M. Booth, MEng, DPhil

University of Oxford Department of
Engineering Science, Parks Road,
OX1 3PJ, Oxford, United Kingdom



Editors

C. Finot

University of Burgundy, Dijon,
France



Editors

S. Gigan

Sorbonne University, Paris, France

[View full Editorial Board](#)



FOUNDING EDITOR: F. Abelès, Paris, France

EDITOR-IN-CHIEF:

M.J. Booth, University of Oxford, Dept. of Engineering Science,
Parks Road, Oxford, OX1 3PJ, **UK**,
E-mail: martin.booth@eng.ox.ac.uk

EDITORS:

N. Broderick, Dept. of Physics, University of Auckland,
Private Bag, 92019 Auckland, **New Zealand**,
E-mail: n.broderick@auckland.ac.nz

L.R. Chen, Dept. of Electrical and Computer Engineering,
McGill University, 3480 University Street, Montreal, H3A 2A7,
Quebec, Canada.
E-mail: lawrence.chen@mcgill.ca

S. Gigan, Sorbonne University, Paris, **France**,
E-mail: sylvain.gigan@lkb.ens.fr

A.C. Peacock, Optoelectronics Research Centre,
University of Southampton, Southampton, SO17 1BJ,
United Kingdom.

E-mail: acp@orc.soton.ac.uk

P. Verma, Dept. of Applied Physics,
Osaka University, Osaka, **Japan**,
E-mail: verma@ap.eng.osaka-u.ac.jp

ADVISORY EDITORIAL BOARD

Australia

M. Gu, Hawthorn
Y. Kivshar, Canberra
E. Li, Wollongong
B. Luther-Davies, Canberra
H. Pask, Sydney
M. Steel, Sydney

Canada

J. Yao, Ottawa

China

Q. Gong, Beijing
J. Liu, Harbin
L. Tong, Huangzhou

France

P. Chavel, Palaiseau cedex
J.M. Dudley, Besancon

Germany

T.W. Hänsch, Munich
A. Tuenermann, Jena

Hong Kong SAR

K.S. Chiang, Kowloon
D.P. Tsai, Kowloon

Israel

B. Malomed, Tel Aviv

Italy

G. Cincotti, Rome
F. Gori, Rome

New Zealand

H.J. Carmichael, Auckland

Russia

V.G. Veselago, Moscow

Saudi Arabia

Z. Ficek, Riyadh

South Korea

D. Ahn, Seoul
B. Ham, Gwangju
K. Oh, Seoul


Sweden

A.T. Friberg, Stockholm

USA

A. Lakhtakia, Pennsylvania

Actions for selected articles

[Select all](#) / [Deselect all](#) Download PDFs Export citations Show all article previews

Contents

I. Physical optics

IIa. Photonic signal processing and communications

IIb. Optical Imaging Systems


III. Guided wave optics

VI. Quantum optics

VII. Lasers and Laser Applications

VIII. Nonlinear optics

IX. Nano and Micro optics

 Research article  Full text access

Gain-coupled 770 nm DFB semiconductor laser based on surface grating


Chunkao Ruan, Yongyi Chen, Feng Gao, Li Qin, ... Lijun Wang

Article 126377

 Download PDF Article preview ▾ Research article  Full text access1064/1342 nm dual-wavelength double electro-optical Q-switched Nd:YVO₄ laser

C. Wang, Y. Wen, Y.H. Wang, C.T. Wu

Article 126404

 Download PDF Article preview ▾ Research article  Full text access

Improving modulation bandwidth of tunable three sections distributed Bragg reflector lasers by using asymmetric nonlinear gain: Design and simulation

Ye Liu, Da Chen, Yonglin Yu

Article 126439

 Download PDF Article preview ▾ Research article  Full text access

Double-side polished fiber for generation of mode-locked fiber lasers

H. Ahmad, A.S. Sharbirin, M.M. Ariannejad

Article 126476

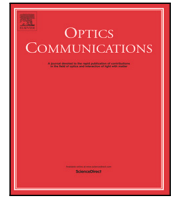
 Download PDF Article preview ▾ Research article  Full text access

The role of metastable atoms in atomic excitation process of magnesium in microwave-assisted laser plasma

Ali Khumaeni, Katsuaki Akaoka, Masabumi Miyabe, Ikuro Wakaida

Article 126457

 Download PDF Article preview ▾



Interferometric imaging for the tomography of rough particles in a flow: A case study

Marc Brunel^{a,*}, Barbara Delestre^a, Mohamed Talbi^a, Michael Fromager^b

^a UMR CNRS 6614 CORIA, Université de Rouen Normandie, Avenue de l'Université, BP 12, 76801 Saint-Etienne du Rouvray Cedex, France

^b UMR CNRS 6252 CIMAP, CEA, Ensicaen, Université de Caen, 6 Bd Maréchal Juin, F-14050 Caen Cedex, France

ARTICLE INFO

Keywords:

Interferometric particle imaging
Speckle
Rough particles
Tomography

ABSTRACT

The possibility to perform the tomography of irregularly-shaped rough particles in a flow using multi-view interferometric imaging is investigated. Combining three perpendicular angles of views, we reconstruct a family of possible 3D-shapes from speckle patterns. The estimation of an error parameter enables the elimination of erroneous 3D-shapes to obtain a more accurate estimation of the particle's volume. The principle is tested and confirmed experimentally by analyzing a set of three interferometric images of "programmable" particles generated by a digital micromirror device.

1. Introduction

The tomography of irregularly-shaped particles in a flow is particularly interesting for meteorology, combustion, nuclear safety and any domain concerned. In many cases, a single-shot technique is necessary because the speed of particles can be very important, and instruments should tend ideally to a real-time analysis. A configuration as the CT-scan (computed tomography scan) in medicine where the object is fixed while the X-ray tube rotates around the object is not applicable. In a similar way, other methods as confocal microscopy, electron, or optical tomographic microscopy require fixing, trapping or confining particles [1–5]. In airborne operation or in icing wind tunnels for example, the relative speed of particles as ice crystals or ashes due to the plane's flight can exceed 200 m s^{-1} . A setup where the particle is illuminated by a unique short flash, while different sensors acquire simultaneously the signal delivered by the particle in different directions, must be envisaged. Light scattering techniques are good candidates because they can answer these requirements, and first set-ups have been developed, using digital holography for example [6].

In this family of techniques based on light scattering properties, interferometric particle imaging appears as another interesting candidate [7]. When illuminated by a laser pulse, rough particles generate interferometric images that are speckle patterns. They can be linked quantitatively in size and shape with the initial shape of the particle [8–14]. Dual-view set-ups have been tested to make simple 3D-particle's shape recognition, or to estimate the volume of ice particles in a flow [7,9,12]. But set-ups proposing three perpendicular angles of view to give a more-complete description of the particle have not been done yet. One difficulty arises from the analysis of the interferometric images

of the particles. After 2D-Fourier transformation, these images give the 2D-autocorrelation of the contour of the particle projected in the plane of the CCD sensor (corresponding to this angle of view). As the 2D-autocorrelation of a 2D-shape is not the 2D-shape itself, the reconstruction procedure combining different views can be particularly complex. It is the aim of this study to realize a case study in order to understand the difficulties that can appear from the combination of three views from three perpendicular angles of view.

Section 2 will describe the principle of the case study carried out in this article. Section 3 will then describe the experimental set-up used to record the interferometric images of "programmable" rough particles. It uses a Digital Micromirror Device (DMD) [15,16]. The interferometric images of a "programmable" particle, observed from three perpendicular angles of view, will be presented and analyzed. Section 4 will propose 2D-reconstructions of the three faces of the particle, while 3D-reconstructions combining the three perpendicular angles of view will be realized in Section 5. This section will show how a reconstruction's error parameter can be defined, how it can be used to refine the particle's shape reconstruction and to reduce the uncertainty about the particle's volume combining the three views. Section 6 will investigate the possibility to generalize the conclusions to other cases.

2. Principle of the case study

Interferometric Particle Imaging (IPI) enables rough particle sizing. First developed to measure the size of spherical droplets or bubbles, it could be extended to the analysis of irregularly-shaped rough particles. Let us consider an irregular rough particle under coherent laser

* Corresponding author.

E-mail address: marc.brunel@coria.fr (M. Brunel).



Black metal nanoparticles from abrasion processes in everyday life: Bicycle drivetrains and rock-climbing ropes

Hans Moosmüller^{a,*}, Ramesh Giri^b, Christopher M. Sorensen^b, Matthew J. Berg^b

^a LASSO—Laboratory for Aerosol Science, Spectroscopy, and Optics, DRI—Desert Research Institute, NSHE—Nevada System of Higher Education, 2215 Raggio Parkway, Reno, NV 89512, USA

^b Department of Physics, Kansas State University, 1228 N. 17th Street, Manhattan, KS 66506-2601, USA

ARTICLE INFO

Keywords:

Metallic nanoparticles
Single scattering albedo
Appearance

ABSTRACT

Black objects are sometimes associated with black carbon, while shiny, highly reflecting surfaces are typically associated with metals. Here, we discuss several objects in everyday life that upon use take on a black color that is unlikely to be due to black carbon. We propose that this black color is caused by the formation of metallic nanoparticles from abrasion processes. We support this hypothesis using Mie theory and the fact that spherical metal particles are only shiny or bright if the imaginary part of their refractive index and its product with the particle size-parameter are both larger than three. While this is commonly true for bulk metals, the second condition is generally not fulfilled for metallic nanoparticles, and hence, such particles become highly absorbing, i.e., black. For the black grime accumulated on bicycle drivetrains and climbing ropes, we detected metal nanoparticles with electron microscopy, which likely originated from mechanical abrasion processes during use.

1. Introduction

In terms of visual appearance under white-light illumination, the whiteness of a particle is usually quantified by the single scattering albedo (SSA), which is the ratio of the scattering cross section C_{sca} and extinction cross section C_{ext} [1],

$$\text{SSA} = \frac{C_{\text{sca}}}{C_{\text{ext}}} = 1 - \frac{C_{\text{abs}}}{C_{\text{ext}}}. \quad (1)$$

In Eq. (1), C_{ext} is the sum of C_{sca} and the absorption cross section C_{abs} for a given wavelength λ of incident light. Due to the conservation of energy, the SSA is bounded as $0 < \text{SSA} \leq 1$. When the $\text{SSA} = 1$ across the visible wavelength range the appearance of a particle is described by terms like “white”, “shiny”, “bright”, or “reflective”, because all extinction is caused by scattering. If the SSA equals zero across the visible wavelength range, the term “black” is appropriate since the extinction is exclusively due to absorption. Values for the SSA between zero and one indicate an appearance in different shades of “gray”, or possibly a colored appearance if the material exhibits a significant variation of its refractive index and SSA as function of wavelength. The term “white” used below will denote a particle exhibiting $0.7 < \text{SSA} \leq 1$, “gray” for $0.2 < \text{SSA} \leq 0.7$, and “black” for $\text{SSA} \leq 0.2$. Because of its connection to energy conservation, the SSA is also an important quantity in energy-budget considerations of physical systems involving light scattering from particles. For example, the SSA is the

dominant intensive property for aerosol-particle radiative forcing in the atmosphere [2–4].

In the following, we consider two common objects encountered in everyday life, a bicycle drivetrain and a rock-climbing rope, where grime is produced through use that eventually takes on a black appearance. We propose that the black appearance originates from black metallic nanoparticles that accumulate in the grime due to mechanical abrasion and support this hypothesis with Mie theory and electron microscopy of the grime material. For simplicity, we focus our theoretical considerations on homogeneous spherical particles, hence the use of Mie theory [5].

The appearance, i.e., SSA here, of metallic nanoparticles is completely described in Mie theory by the particle’s complex-valued refractive index $m = n + i\kappa$, where n and κ are the real and imaginary parts of m , respectively, and the size parameter $x = \pi D/\lambda$, where D is the particle diameter. Moreover, “Mie theory, limited though it may be, does provide a first-order description of optical effects in nonspherical particles, and it correctly describes many small-particle effects that are not intuitively obvious” [6]. While we use Mie theory to gain basic understanding of SSA, this approach is limited because the metallic particles considered here are not spherical and homogeneous as required by Mie theory and their number density is not sufficiently small for rigorous application of the single scattering concept [6]. We build upon existing discussions for the SSA in the small and large

* Corresponding author.

E-mail address: Hans.Moosmuller@dri.edu (H. Moosmüller).