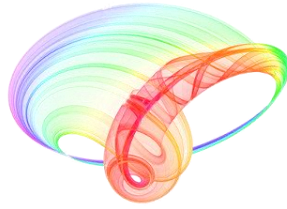


Book of abstracts



PHOTONICA2017

The Sixth International School and Conference on Photonics

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&H2020-MSCA-RISE-2015 CARDIALLY workshop



28 August – 1 September 2017

Belgrade, Serbia

Editors

Marina Lekić and Aleksandar Krmpot

Institute of Physics Belgrade, Serbia

Belgrade, 2017

ABSTRACTS OF TUTORIAL, KEYNOTE, INVITED LECTURES,
PROGRESS REPORTS AND CONTRIBUTED PAPERS

of

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Technical assistance

Marko Nikolić and Danica Pavlović

Publisher

Institute of Physics Belgrade
Pregrevica 118
11080 Belgrade, Serbia

Printed by

Serbian Academy of Sciences and Arts

Number of copies

300

ISBN 978-86-82441-46-5

PHOTONICA 2017 (The Sixth International School and Conference on Photonica - www.photonica.ac.rs) is organized by Institute of Physics Belgrade, University of Belgrade (www.ipb.ac.rs), Serbian Academy of Sciences and Arts (www.sanu.ac.rs), and Optical Society of Serbia (www.ods.org.rs).



Other institution that helped the organization of this event are: Vinča Institute of Nuclear Sciences, University of Belgrade (www.vinca.rs), Faculty of Electrical Engineering, University of Belgrade (www.etf.bg.ac.rs), Institute of Chemistry, Technology and Metallurgy, University of Belgrade (www.ihtm.bg.ac.rs), Faculty of Technical Sciences, University of Novi Sad (www.ftn.uns.ac.rs), Faculty of Physics, University of Belgrade (www.ff.bg.ac.rs), and Faculty of Biology, University of Belgrade (www.bio.bg.ac.rs).

PHOTONICA 2017 is organized under auspices and with support of the Ministry of Education, Science and Technological Development, Serbia (www.mpn.gov.rs). PHOTONICA 2017 is supported and recognized by The Integrated Initiative of European Laser Research Infrastructures LaserLab-Europe (www.laserlab-europe.eu) and European Physical Society (www.eps.org).



The support of the sponsors of PHOTONICA 2017 is gratefully acknowledged:



Effect of the Corrected Ionization Potential on the High-Harmonic Generation transition rate in a linearly polarized laser field

Violeta Petrović, Hristina Delibašić, Kristina Isaković

Department of Physics, Faculty of Science,

University of Kragujevac, Serbia

e-mail: violeta.petrovickg@gmail.com

Abstract: In this paper we theoretically described the influence of the ponderomotive and the Stark shift [1,2] on the high-order harmonic generation's transition rate (HHG rate) for the cases of noble and alkali atoms. To describe harmonic generation we used the analytical formula by Frolov et al. [3] which is derived for a weakly bound electron in the tunneling limit and modified it in way to include mentioned effects. Firstly, we assumed the general beam shape in nonrelativistic, linearly polarized laser field. We showed that the inclusion of these effects affects the HHG rate. For the same conditions, the intensity of the alkali harmonics were considerably weaker compared to the intensity of noble harmonics [4]. Also, the Stark shift for the alkali atoms induces not only decrease of the peak heights i.e. decrease of the ionization yield, but also the peak broadening. At the end, we analyzed the influence of the beam shape on the behavior of obtained theoretical curves. We considered two types of profiles of laser radiation, Gaussian and Lorentzian [5,6]. It is shown that the HHG rate depends on the spatial distribution of laser beam profiles.

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Energy distribution of ejected photoelectrons in $K^{-2}V$ process

Kristina Isaković, Violeta Petrović, Hristina Delibašić

Department of Physics, Faculty of Sciences,

Kragujevac University, Serbia

e-mail: kristina_isakovic@yahoo.com

Abstract: In the last few years, a great deal of attention has been devoted to Double-Core-Hole states, and especially those involving K-shells, K^{-2} states, as well as, $K^{-2}V$ states, which consider simultaneous core ionization and core-excitation [1]. In this paper we have given a theoretical framework that enables prediction of the energy distribution of ejected photoelectrons in $K^{-2}V$ process. In order to achieve this, we obtained a formula for the transition rate taking into account the channels of sequential and nonsequential ionization, and ionization with ionic core excitation, i.e. we treated the ionization rate as a cumulative contribution of simultaneous processes, ionization and excitation [2,3]. We assumed a non-relativistic domain and linearly polarized laser field. We started with the $K^{-2}V$ process in helium like atoms and showed that inclusion of additional processes significantly influences the transition rate and at the same time the energy distribution of the ejected photoelectrons, especially in the energy range of the ejected photoelectrons bringing us to the energy range of low energy electrons which have a significant role in bio damage [4].

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