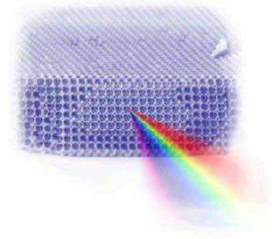
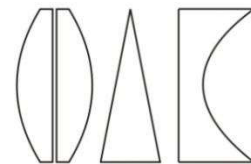


University of Belgrade  
Institute of Physics Belgrade  
Kopaonik, March 14-17, 2021



Book of Abstracts  
**14<sup>th</sup> Photonics Workshop**  
(Conference)



## **14<sup>th</sup> Photonics Workshop (2021)**

### **Book of abstracts**

Kopaonik, Serbia, March 14-17, 2021

Publisher, 2021:

Institute of Physics Belgrade

Pregrevica 118

11080 Belgrade, Serbia

Editors:

Dragan Lukić, Marina Lekić, Zoran Grujić

**ISBN 978-86-82441-52-6**

Printed by:

NEW IMAGE d.o.o.

Tošin Bunar 185, Belgrade

Number of copies: 30

CIP - Каталогизација у публикацији - Народна библиотека Србије, Београд

535(048)

681.7(048)

66.017/.018(048)

PHOTONICS Workshop (14 ; 2021 ; Kopaonik)

Book of Abstracts / 14th Photonics Workshop, (Conference), Kopaonik,  
March 14-17, 2021 ; [editors Dragan Lukić, Marina Lekić, Zoran Grujić]. -  
Belgrade : Institute of Physics, 2021 (Belgrade : New image). - 46 str. :  
ilustr. ; 25 cm

Tiraž 30. - Registar.

ISBN 978-86-82441-52-6

а) Оптика - Апстракти б) Оптоелектроника - Апстракти с) Технички  
материјали - Апстракти

COBISS.SR-ID 33997321

## Laser-induced parallel structures on multilayer thin films of Ni, Pd, Ti, Ta and W

Aleksander G. Kovačević<sup>1</sup>, Suzana Petrović<sup>2</sup>, Jelena Potočnik<sup>2</sup>, Marina Lekić<sup>1</sup>, Branislav Salatić<sup>1</sup>, Vladimir Lazović<sup>1</sup>, Dejan Pantelić<sup>1</sup>, Branislav Jelenković<sup>1</sup>

(1) *Institute of Physics, University of Belgrade, Pregrevica 118, 11080 Belgrade, Serbia*

(2) *Institute of Nuclear Sciences “Vinča”, University of Belgrade, POBox 522, 11001 Belgrade, Serbia*

**Contact:** A. Kovačević ( [aleksander.kovacevic@ipb.ac.rs](mailto:aleksander.kovacevic@ipb.ac.rs) )

**Abstract.** The interaction of ultrashort laser beam with metal surfaces may induce the generation of periodic structures (LIPSS) with period less than the incoming wavelength, opening wide area of application [1, 2]. The presence of the underneath layer influences the quality of the LIPSS [3]. We have exposed multilayer thin films Ni/Ti, Ni/Pd, W/Ti, Ti/Ta to femtosecond beams of various wavelengths and powers. The interactions have been performed by Mira900 fs laser of Coherent. Detailed surface morphology after irradiation was examined firstly by optical microscopy, and then by scanning electron microscopy (JEOL JSM-7500F, Tokyo, Japan). Two types of structures have been noticed. Their appearance differ in the direction against the polarization direction, in pronounced ablation and in the spatial period, enabling their grouping into LIPSS of higher and lower spatial frequencies. Surface plasmon polariton is seen as the most probable cause of periodic distribution of energy at the surface and consequently to LIPSS.

**Acknowledgements.** The work was supported by the Ministry of Science of the Republic of Serbia under No. III45016 and OI171038. The authors also thank dr Davor Peruško from the Institute of Nuclear Sciences “Vinča” (University of Belgrade), dr V. Pavlović from the Faculty of Agriculture (University of Belgrade), dr Đ. Veljović and dr Ž. Radovanović from the Faculty of Technology and Metallurgy (University of Belgrade) and dr A. Krmpot and dr M. Rabasović from the Institute of Physics (University of Belgrade), for their valuable support.

### REFERENCES

- [1] H. M. van Driel, J. E. Sipe and J. F. Young, *Phys. Rev. Lett.* **49**, 1955 (1982).
- [2] A. Y. Vorobyev and C. Guo, *Laser Photonics Rev.* **7**, 385 (2013).
- [3] A. G. Kovačević, S. Petrović, et al., *Appl. Surf. Sci.* **326**, 91 (2015).