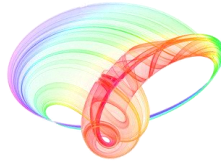# Book of abstracts

PHOTONICA2019

The Seventh International School and Conference on Photonics, 26 August – 30 August 2019, Belgrade, Serbia

& Machine Learning with Photonics Symposium (ML-Photonica 2019)

& ESUO Regional Workshop

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

of

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Optical and Structural Investigation of Cr_2O_3 Thin Films: the Effect of Thickness on Their Applicability in Differential Photodetectors

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We report an experimental study of Cr_2O_3 thin films (60, 300, 350 nm) deposited on silicon and glass substrates using the Balzers Sputtron II System. The structural and optical properties were investigated by means of AFM, XRD, UV-VIS, Raman and infrared spectroscopy, in order to determine the suitability of the as-obtained films as potential active layers in novel differential inorganic photodetectors. AFM measurements revealed that all films are well-deposited, without the presence of any cracks or voids. The crystalline peaks in the XRD spectra belonged to the trigonal Cr_2O_3 structure. UV-VIS measurements revealed a strong red shift in the absorption maxima with reducing film thickness. IR and Raman spectroscopy show a dependence of the characteristic vibrations on film thickness as well as on the substrate. In conclusion, our results indicate that the Cr_2O_3 film of 300 nm thickness is so far the most promising candidate as photoactive semiconducting layer in differential photodetectors.