

PHOTONICA 2019

7TH INTERNATIONAL SCHOOL AND CONFERENCE ON PHOTONICS

*with Symposium Machine Learning with Photonics,
The European synchrotron and FEL user organization (ESUO) Regional
Workshop and COST action CA16221 ATOM-QT*



Book of abstracts



Editors

Milica Matijević,
Marko Krstić,
Petra Beličev

Belgrade, Serbia,
26th - 30th August 2019.

Effects of temperature on luminescent properties of CaGdAlO₄:Er,Yb nanophosphor

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CaGdAlO₄ crystal doped with Er, Yb or other rare earth is commonly used as infrared lasing material [1-4]. In this study we analyze effects of temperature on luminescent properties of nanocrystalline CaGdAlO₄ doped with Er³⁺ and Yb³⁺ cations. Material was synthesized by combustion method, as described in [5].

Our experimental setup is presented in detail in [6]; and its use for analysis of thermometric phosphors in [7-9]. However, in this study, because CaGdAlO₄:Er,Yb is upconverting material, we have used pulsed laser diode excitation at 980 nm. The structure of material was observed by high resolution scanning electron microscope (SEM). The experimental setup for luminescence measurement as a function of temperature is described in [10].

By using the results of our measurements of CaGdAlO₄:Er,Yb nanophosphor in temperature range from 300 K up to 680 K we have determined temperature sensing calibration curve and absolute and relative sensitivity of this material. The relative sensitivity is about 0.7 % K⁻¹ on room temperature and decreases with temperature increase. Comparing this results with characteristics of other thermographic phosphors we conclude that synthesized CaGdAlO₄:Er,Yb nanophosphor is appropriate material for remote temperature sensing.

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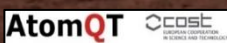
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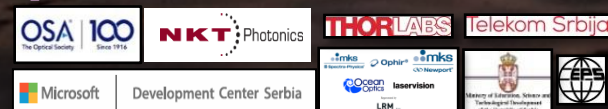
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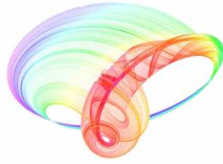
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PHOTONICA2019

The Seventh International School and Conference on
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& Machine Learning with Photonics Symposium
(ML-Photonica 2019)



& ESUO Regional Workshop



& COST action CA16221



Editors: Milica Matijević, Marko Krstić and Petra Beličev

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