

Measuring the time resolved fluorescence spectra from powder samples of YAG:Dy

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Yttrium aluminum garnet (YAG) materials have been widely used as scintillators, solid-state lasers, as well as phosphors. Dysprosium-doped YAG is thermographic phosphor used to measure surface temperature by applying a thin coating of phosphors to the substrate. In this study we investigate time resolved fluorescence spectra from powder samples of YAG:Dy. Other powder samples are also synthesized [1] and ready for time resolved analysis of fluorescence properties.

The basic setup of our time resolved laser induced fluorescence experiment consists of Nd-YAG Vibrant OPO laser system and Hamamatsu streak camera. The output of the OPO can be continuously tuned over a spectral range from 320 nm to 475 nm. The emission spectra are recorded using a streak scope (Hamamatsu model C4334-01) with integrated video streak camera. A detailed description of our TR-LIF and recent results are published elsewhere [2-4]. Inherent advantage of our detection system is its 2D nature. Compared to other spectroscopic systems streak camera records whole time development of spectra, so researcher doesn't have to guess which part of time resolved spectrum is of interest.

The fluorescence emission is collected at 90° from the excitation and dispersed by a 0.3 m focal length triple grating imaging spectrograph (SpectraPro-2300i). For measurements presented here the grating of 50 g/mm was used covering a 330 nm spectral range.

We didn't perform complex coating of phosphors as described for example in [5]. Powder samples of YAG:Dy were used as a target without any preparation. The fluorescence spectra of YAG:Dy powder were recorded at room temperature. We used OPO tuned 340 nm excitation and obtained similar spectra as presented in [6].

Acknowledgments: This work has been done within the projects MESTD RS OI 171020 and Bilateral Project Serbia – Slovenia #651-03-1251/2012-09/03

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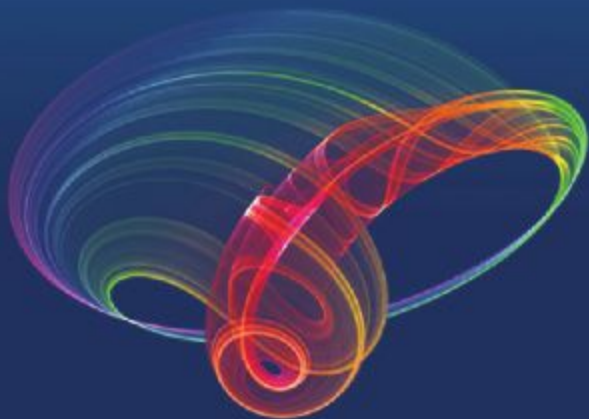


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of
Lectures, Talks & Contributed Papers

Editors

Dragana Jović, Borislav Vasić, Dejan Timotijević,
Radmila Panajotović, and Radoš Gajić

Institute of Physics
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Belgrade, 2013

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