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ESIGN AND DEVELOPMENT OF AN OPTICAL FIBER LASER SYSTEM FOR THE CONTROLLABLE PROCESS OF GRAPHENE OXIDE THIN FILMS*

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Laser processing of thin films is a straightforward and suitable way to achieve new unexplored materials' properties and build various structures. Nowadays, a branch of nanomaterial science is strongly connected with laser processing techniques that include the application of continuous and pulsed lasers [1]. In terms of graphene oxide (GO), the laser processing method allows obtaining unique properties such as turning an insulating GO into conductive reduced GO via a reduction process, caused by local heating. Herein, laser irradiation also provides precise control of the parameters of the GO reduction process such as the power of the laser beam, power density, exposure time, and wavelength. That's why it is important to have an advanced laser system with a set of controllable parameters.

In this work, we design and develop an optical fiber laser system for the controllable process of graphene oxide thin films on a large scale. Our goal is to realize a system with switchable laser modules and an optical fiber delivery system to facilitate laser beam travel from the source to a sample. Moreover, we also aim to integrate a multifunctional detection system to control a set of parameters, such as laser beam profile, laser power, power distribution, and pulse duration.

REFERENCES

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