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شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

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شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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قسم

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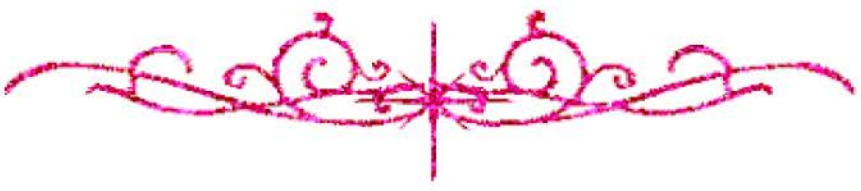

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شبكة المعلومات الجامعية

بالرسالة صفحات لم ترد بالأصل

INVESTIGATION OF LASER INDUCED PLASMA OF LAYERED TARGETS

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B.Sc. (Chemistery/Physics)

Cairo University, 2002

Thesis

Submitted in partial fulfillment of
the requirements for the degree of
Master of Laser Science

Department of Laser Applications in Metrology, Photochemistry and Agriculture

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2008

SUPERVISION COMMITTEE

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ACKNOWLEDGMENT

I would like to express my deep thanks to **Allah** who guides me to the right ways throughout my work.

I would like to express my profound gratitude and sincere thanks to my supervisor Prof. **Mohamed Abdel Harith Mohamed** Professor of laser physics National Institute of Laser Enhanced Sciences (NILES) Cairo University for his strong supervision, advice and guidance.

Special and deep gratitude is rendered to prof **Emma Angelini** and Dr **Sabrena Grassini**, Dipartinento di Scienze dei Materiali e Ingegneria Chimica, Politecnico di Torino, Italy for thier helping in preperation of the samples.

My deep thanks to all members of **ALS** group at NILES and also to Dr **Arafa Kamal**.

Special thanks to **Abdallah Fathy** my colleague at NILES for his help.

Special and great thanks to my **family** and my wife for their continuous help and support throughout this work.

ABSTRACT

Laser-induced breakdown spectroscopy (LIBS) is a relatively novel technique that is being applied to the characterization of interfaces in layered materials as an alternative to other classic surface analytical techniques. The composition of each individual layer, particularly at the interface, which is available from a depth profile, is much more informative than the composition of one layer in addition to the exact location of the interface. In the present work the change of laser irradiance at its fundamental wavelength (λ = 1064 nm) by changing the working distance (WD), which is the difference between the lens-to-sample distance and the focal length of the lens, has been found to be a very critical parameter. The effect of changing WD on the intersection point, the ablation rate and crater depth of Au, Ag and Zn thin films onto Cu substrates has been studied by using 50mJ, Nd: YAG laser pulses. The experimental findings, obtained with fixed experimental set-up, showed that lowering the irradiance, the intersection point (number of laser pulses that needed to reach the interface), while the average ablation rate and the crater depth are decreasing. Moreover the possibility of employing relatively high energy laser pulses for depth profiling analysis has been demonstrated. Optical microscopic studies for the produced craters of the layered targets were examined. The plasma parameters (electron temperature and electron density) also have been studied.

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