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# جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

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# **THERMAL EFFECTS INDUCED IN SOLID TARGETS BY LASER RADIATION**

By

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## **Abstract:**

Laser pulse shapes characterized by different parameters were obtained through a suggested semi-empirical mathematical expression.

Laser heating of a homogeneous metallic slab is considered. The heat diffusion equation is solved using the Fourier series expansion technique. Expressions for the temperature profile  $\theta(x,t)$  within the slab, the temperature of the front surface  $\theta(0,t)$  and that for rear surface  $\theta(d,t)$  were obtained for four different elements, namely Aluminum, Copper, Silver and Gold.

A two-phase problem is also studied using the integral form of the heat diffusion equation with heat balance equation at the interface between the two phases. The thickness of the molten layer as well as the rate of melting induced by laser, in the solid target for the incident suggested pulse, were obtained.

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**Keywords:**

Thermal effects in solid targets induced by laser. Laser radiation and laser pulses. Heat diffusion equation. Multiphase problems

# **SUMMARY**

