

## **Dedication**

**To my mother and father**

” ” ” ”

**To all members of my family**

” ” ” ”

**To my Teachers**

” ” ” ”

**To my friends**

” ” ” ”

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## **Abstract**

In this thesis, laser induced fluorescence (LIF) technique, was tested for detecting changes in cotton plant due to environmental factors: temperature, time during the day hours and pollution stress.

Fluorescence measurements were carried out to determine the fluorescence intensity ratio (FIR)  $F_{685}/F_{730}$  with respect to change in temperature and during the day hours. It has been noticed that this ratio(FIR) decreases when temperature increases. Also the ratio (FIR) decreases when pollution concentration increases. Laser induced fluorescence can be a suitable method of monitoring changes in chlorophyll content in a non-destructive way in cotton plant during physiological changes during the day hours.

Results of this study demonstrate the capability of early detection of cotton influences due to air pollution and environmental stresses, using laser induced fluorescence technique.

## الخلاصة

في هذه الأطروحة إستخدمت تقنية التفلور بالحث الليزري للكشف عن التغيرات في نبات القطن والناجمة عن العوامل البيئية كدرجة الحرارة و الزمن خلال اليوم والتلوث.

أخذت القياسات الناتجة عن الفلورة لحساب النسبة بين القمة عند الطول الموجي 685 nm إلى القمة عند الطول الموجي 730 nm (F685/F730) بالنسبة إلى التغير في درجة الحرارة ثم حسبت هذه النسبة خلال ساعات اليوم. لوحظ أن هذه النسبة تتناقص بزيادة درجة الحرارة، أيضا تتناقص مع زيادة تراكم الغاز الملوث. إستخدمت تقنية التفلور بالحث الليزري في الكشف المبكر عن التغير في كمية الكلوروفيل في نبات القطن خلال ساعات اليوم.

أظهرت نتائج هذه الدراسة قابلية تقنية التفلور للحث الليزري للكشف عن التغير الطارئ على نبات القطن نسبة لتلوث الهواء والعوامل البيئية الأخرى.

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