hossam maghraby

شبكة المعلومات الجامعية

بسم اللّه الرحمن الرحيم

hossam maghraby

شبكة المعلومات الجامعية

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التوثيق الالكتروني والميكروفيلم

hossam maghraby

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

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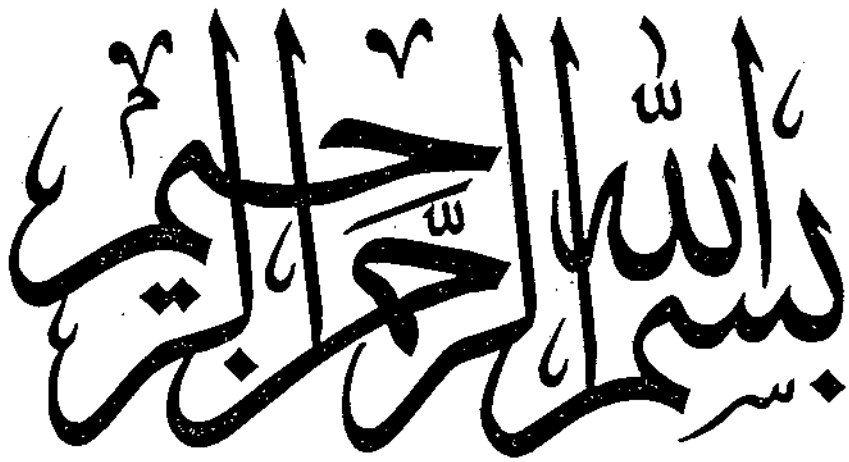
بالرسالة صفحات
لم ترد بالأصل


بسم الله الرحمن الرحيم

بسم الله الرحمن الرحيم

"و علمك ما لم تكن تعلم و كان فضل الله عليك عظيما"

صدق الله العظيم

سورة النساء – الأية (١١٣)

WAVEFRONT-GUIDED VERSUS CONVENTIONAL LASER IN SITU KERATOMILEUSIS FOR LOW AND MODERATE MYOPIA

Thesis

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To my Mother

CONTENTS

APPENDIX

Definitions:

Before introducing the new science of ophthalmic wavefront tecnology, early results, limitation, and future directions, first, it might be helpful to define some of the terms we will be using

There are four causes for the compromise of the quality of the human eyes picture :-

- Light scatter.
- Diffraction by the pupil.
- Monochromatic aberrations.
- Chromatic aberrations.

Light scatter:- It has little value in affecting the retinal image quality in young healthy eyes.

Diffraction:- by the pupil plays a role only in small pupil diameters and looses significance in diameters above 3 mm. At pupillary diameter above 2 mm the monochromatic aberrations gain significance and dominate the determinance of optical quality of the retinal image.. This applies especially with pupil size of 3-4 mm and under mesopic conditions[1].

MONOCHROMATIC ABERRATIONS

Seidel defined five monochromatic aberrations, spherical aberration, coma, oblique astigmatism, curvature of image, and distortion.

1)The defocus in a system is the failuire of the parallel light rays to be brought to a focus on the image plane .[1]

2)Astigmatism is the wavefront aberration, in which the light rays passing through a lens do not form a focal point, but rather form two perpendicular focal lines lying in a certain distance (lack of point).[2]

3)Spherical aberrations:

Occur when a pencil of light is refracted by a large-aperture optical system. Spherical aberrations affect the sharpness of image points.[3]

Spherical lenses don't bring all rays to a perfect focus point. For a plus spherical lens, there is increasing converging power as the lateral distance from the central ray is increased. Thus, spherical aberrations cause rays at the edge of the lens to be focused anterior to the focus of the central ray. Instead of all of the rays of light coming to a concise point of focus, they are distributed over a small region of the image, and there is no single sharp point of focus. Spherical aberrations in humans are due to the anterior surface of the cornea and the anterior and posterior surfaces of the crystalline lens.[3]

The effect of spherical aberrations on the human eye is reduced by several factors:

1) The anterior surface of the cornea has a natural prolate shape or flatter paracentral and peripheral curves than centerally. As we ablate for myopia and flatten the center, we reduce prolateness and actually increase spherical aberrations.

2) In the eye, the iris acts as a stop to reduce spherical aberrations. The impairment of the visual acuity that occurs when the pupil is dilated