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View Abstract

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Commercial Relationships Disclosure (Abstract): Mikel Aldaba: Commercial Relationship(s);Universitat Politècnica de Catalunya:Code P (Patent) Fernando Diaz Douton: Commercial Relationship: Code N (No Commercial Relationship) Jaume Pujol: Commercial Relationship(s);Universitat Politècnica de Catalunya:Code P (Patent)
Study Group: (none)
<u>ABSTRACT</u>
TITLE: Extended measured area tear film stability assessment method by corneal reflex image degradation.
ABSTRACT BODY: <p>Purpose: Recently a new method for the tear film stability measurement based on the corneal reflex image degradation has been proposed (Aldaba <i>et al.</i> "Tear film stability assessment by corneal reflex image degradation". <i>JOSA A</i>, 36(4), B110-B115). The method on its original version is simple, objective, and non-invasive, but has a main limitation: the reduced measured area. We present a modified version of the method that extends the measured area.</p> <p>Methods: A new optical design of the original setup for tear film stability measurement based on corneal degradation has been proposed. The new design is based on having normal light incidence on the corneal plane, to do so, the focus of the incident light falls on the center of curvature of the cornea. Four different lenses that theoretically provided a large measured area have been tested: 1) glass spheric lens, 50.00mm focal length, 50.00mm diameter, 2) glass aspheric lens, 50.00mm focal length, 50.00mm diameter, 3) plastic aspheric lens, 35.74mm focal length, 35.00mm diameter, 4) plastic aspheric lens, 49.80mm focal length, 51.00mm diameter. The incidence beam area at corneal plane was measured recording an image at this plane and counting the number of pixels that form the beam. The optical quality of the system was evaluated for each lens by means of the full width at half maximum of the recorded image when using an ophthalmic lens as artificial cornea (PMMA material and radius of curvature 8mm).</p> <p>Results: The measured incidence beam area for the four tested lenses was: 1.79mm for lens #1, 7.72mm for lens #2, 3.36mm for lens #3 and 7.04mm for lens #4. The full width at half maximum (the lower the value the better the image quality) of the recorded image with the artificial cornea was of 8 pixels for lens #1, 4 pixels for lens #2, 5 pixels for lens #3 and 20 pixels for lens #4.</p> <p>Conclusions: A new optical design for increasing the measured area of the tear film stability method based on corneal reflex image has been proposed.</p>

The new design is based on the normal incidence of the incident beam on the cornea. Four lenses were tested in the setup; two were discarded due to small beam diameter and one due to poor optical quality. One of the lenses provided the desired beam diameter and optical quality, permitting the improvement of the method.

(No Image Selected)

DETAILS

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