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## [Back to Freepaper Session](#) Modern biometry in short eyes

### Session Details

Session Title: Biometry  
 Session Date/Time: Tuesday 08/10/2013 | 08:00-10:30  
 Paper Time: 08:29  
 Venue: Elicium 2 (First Floor)  
 First Author: : P.Hoffmann *GERMANY*  
 Co Author(s): :

### Abstract Details

**Purpose:**

To evaluate the potential benefit of raytracing IOL calculation utilizing optical lens thickness data

**Setting:**

Private eye clinic in Germany

**Methods:**

174 cataract eyes measured with the Haag-Streit Lenstar between June 2011 and December 2012 with axial lengths < 22 mm were identified. In 124 eyes, complete data sets with refraction and visual acuity 1-3 months after surgery could be obtained. Based on the IOL implanted, the theoretical refraction was predicted by two different raytracing packages (Okulix and PhacoOptics). For comparison purposes, refraction was also predicted by the HofferQ and Holladay formula. The difference between predicted and manifest refraction was evaluated. For the classical formulae, parameters from the ULIB were used. No attempt was made to "optimize" the systematic offset in this group of odd eyes. Of 124 IOLs implanted, 39% were spheric, 61% aspheric, 18% had toric properties. The Okulix software uses full aperture raytracing, PhacoOptics uses paraxial raytracing. The HofferQ and Holladay formula use Gaussian optics. Both raytracing programs use axial length and lens thickness data in their algorithms to predict the postoperative IOL position while the formulae use axial length and corneal radii.

**Results:**

Prediction error (mean ± standard deviation) is -0.08 ± 0.55 dpt for Okulix, -0.07 ± 0.52 dpt for PhacoOptics, -0.23 ± 0.63 dpt for HofferQ and -0.01 ± 0.64 dpt for Holladay. The 95th percentile of absolute prediction error is 1.17 dpt for Okulix, 1.15 for PhacoOptics, 1.40 dpt for Holladay and 1.41 dpt for HofferQ. The differences are significant (Wilcoxon matched-pairs rank test, P < 0.05) for both raytracing vs. both formulae, but not between formulae and between Okulix and PhacoOptics.

**Conclusions:**

Lenstar biometry and IOL calculation using raytracing technology and crystalline lens thickness data considerably improves precision of IOL calculation in short eyes and reduces the number of outliers.

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