

Comparison of axial length measurement with the Zeiss: IOL Master , and Wavelight: Biograph.

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Upgrade: ALLEGRO BioGraph

Technique:

- OLCR Biometer
(Optical Low-Coherence Reflectometry)
- Wavelength: 820 nm
- Interferometric method
- Integrated keratometer
- eyeclick



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What is OLCR Biometry?

- Non-contact, optical procedure
- Laser interferometry
- Using partial coherent light
 - Also known as partial coherence interferometry (PCI) or **optical low coherence reflectometry (OLCR)**
- Measurement process with two light beams:
 - Measuring beam
 - Reference beam

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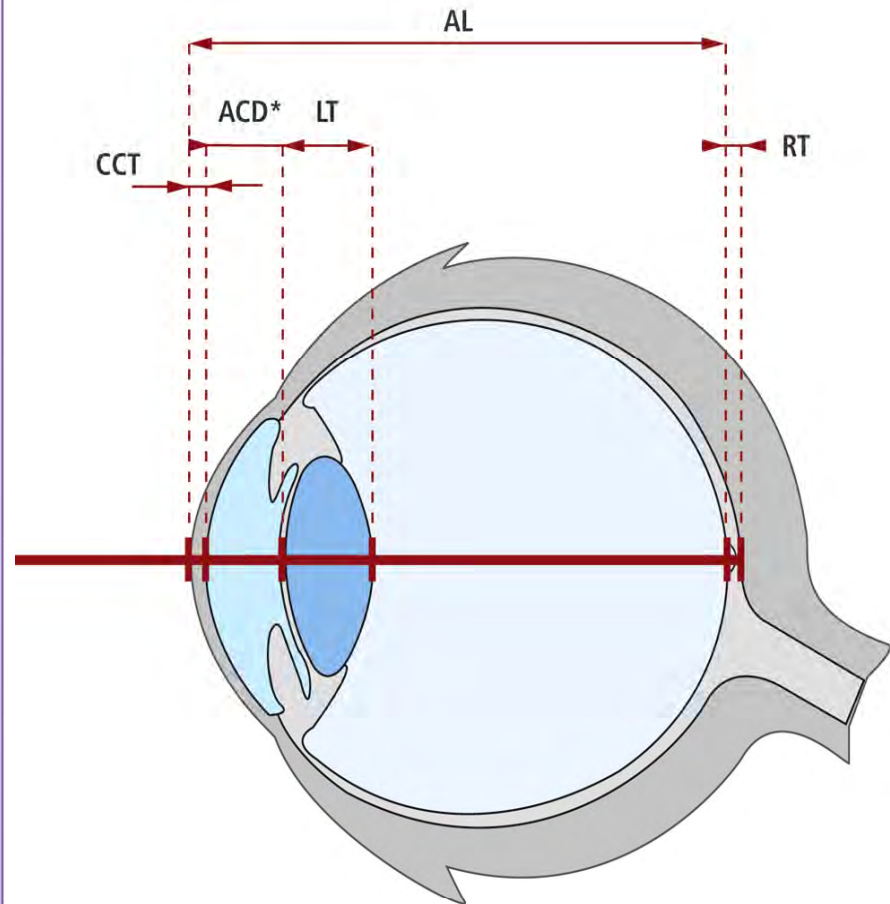
The ALLEGRO BioGraph applications:

✓ A-Scan:

- Axial length (AL)
- Anterior chamber depth (ACD)
- + (Central) Corneal thickness (CCT)
- + Lens thickness (LT)

✓ Corneal curvature (Keratometry)

- + Anatomic (true) chamber depth (ACD_{anatomic})
- + Retina thickness
- ✓ “White to white” distance
- + Pupillometry
- + Position of visual-optical line



* True ACD without CCT = ACD_{anatomic}

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ALLEGRO BioGraph Software Features

- **Patient database**
 - Unrestricted (by quantity) patient database
- **Measurement**
 - Aiming aid
 - Display of immediate results
- **Analysis**
 - A-scan and anterior eye segment analysis
 - Detail zoom for A-scan
- **IOL Calculation**
 - IOL database
 - Internationally established IOL power calculation formulas

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Fields of application

- IOL power calculation
 - Cataract Surgery
 - Refractive lens exchange
- Disease Monitoring
 - Glaucoma monitoring
 - Calculation of eye tissue volumes
 - ...
- Refractive laser surgery
 - LASIK



KARAKOSTA Loukia, 01/01/1929
female, Caucasian / White
ID 3721

Examination 1 of 11/05/09
Analysis 4, standardized
Biometry

Time: 12:48 PM
Duration: 4 min

OD		OS	
24.06 mm	42.68 D	23.93 mm	42.75 D
24.06 mm	42.84 D	23.92 mm	42.75 D
24.06 mm	42.67 D	23.92 mm	42.81 D
24.07 mm	42.71 D	23.92 mm	42.98 D

OD		OS	
Axial length	24.06 mm ±0.004 mm	Axial length	23.92 mm ±0.005 mm
Cornea thickness	522 µm ±1.7 µm	Cornea thickness	537 µm ±2.4 µm
Aqueous depth	3.04 mm ±0.006 mm	Aqueous depth	2.97 mm ±0.010 mm
Lens thickness	4.55 mm ±0.004 mm	Lens thickness	4.65 mm ±0.008 mm
Flat meridian	42.49 D ±0.052 D	Flat meridian	42.70 D ±0.079 D
Steep meridian	42.96 D ±0.169 D	Steep meridian	42.94 D ±0.155 D
Axis	17 ° ±15.0 °	Axis	---

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		OD Right Eye		OS Left Eye	
Measuring mode	Mode	Phakic		Phakic	
Axial length	AL	24.06	mm	23.92	mm
Cornea thickness	CCT	522	µm	537	µm
Aqueous depth	AD	3.04	mm	2.97	mm
Lens thickness	LT	4.55	mm	4.65	mm
Retina thickness	RT	200	µm	200	µm
Flat meridian	K1	42.49	D	42.70	D
Steep meridian	K2	42.96	D	42.94	D
Axis	Axis	17	°		
Astigmatism	AST	0.47	D	0.24	D
Keratometric index	n	1.332		1.332	
White to White	WTW				
Iris barycenter	IC				
Pupil diameter	PD				
Pupil barycenter	PC				

* Value user-defined
⚠ see detail printout
⚠ Analysis

Purpose:

- The purpose of this study was to compare AXL obtained with the IOL Master & Pentacam and with the Wavelight Biograph.



Methods:

- Axial Length in 200 consecutive un-operated practice patients was measured twice with each modality.

Results:

- The mean AXL values as determined with the different modalities (+/-standard deviation) were: 24.52 (+/-0.2) and 24.48 (+/-0.18), respectively. The differences between modalities (+/-95% limits of agreement) were negligible
- **3 cases excluded by IOL master and 2 by Biograph due to PSC cataract**

Conclusion:

- In the assessment of normal eyes, the IOL Master were compared similarly in specificity and sensitivity with the Wavelight Biograph.
- Powerful tool in refractive and cataract surgery
- Input in refractive surgery calculations