

TOMOGRAFIA IN EYE BANKING

Alessandro Ruzza

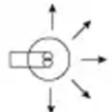
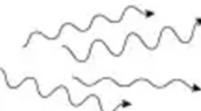
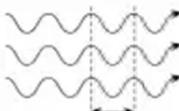
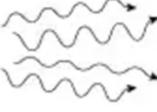
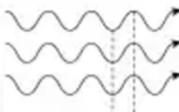
L'AQUILA, 18 MAGGIO 2024

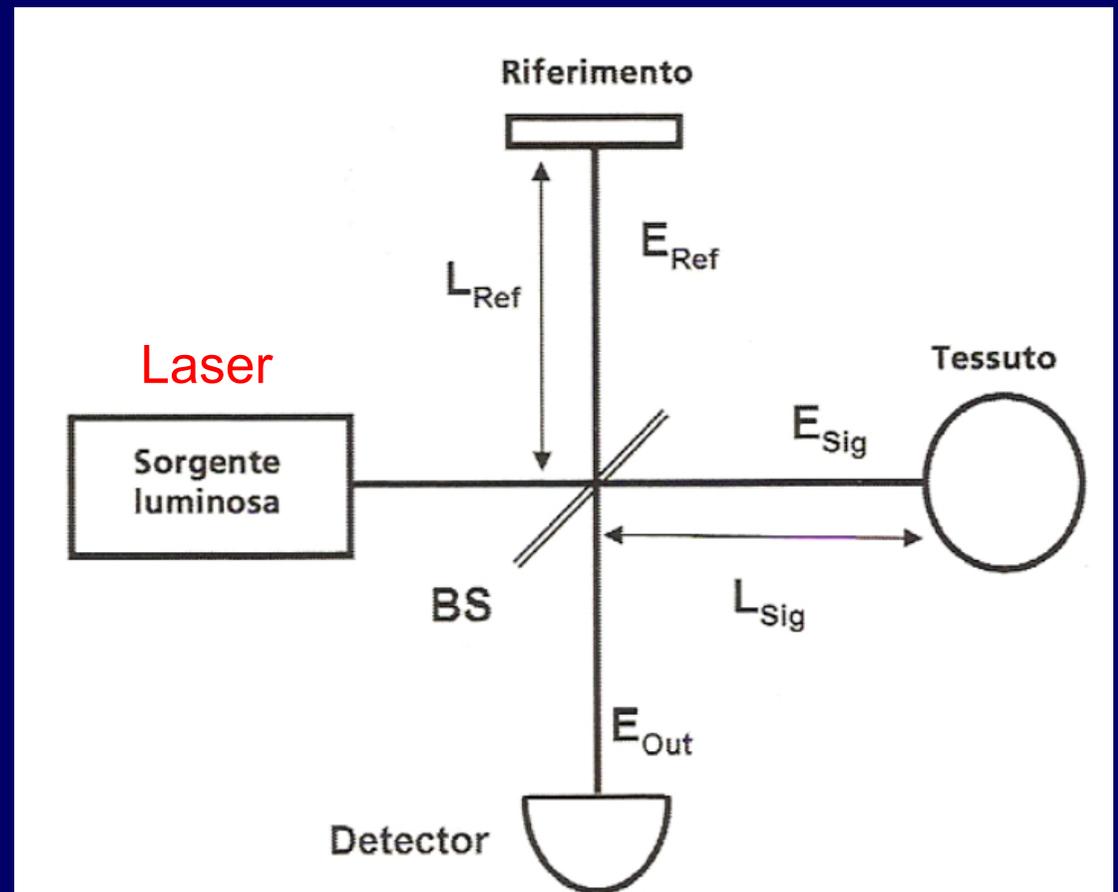
XVI CORSO NAZIONALE SIBO

INTERFEROMETRO

- Fascio di luce laser (coerente) a **precisa lunghezza d'onda**
- Generazione di due fasci di luce in due percorsi equidistanti:

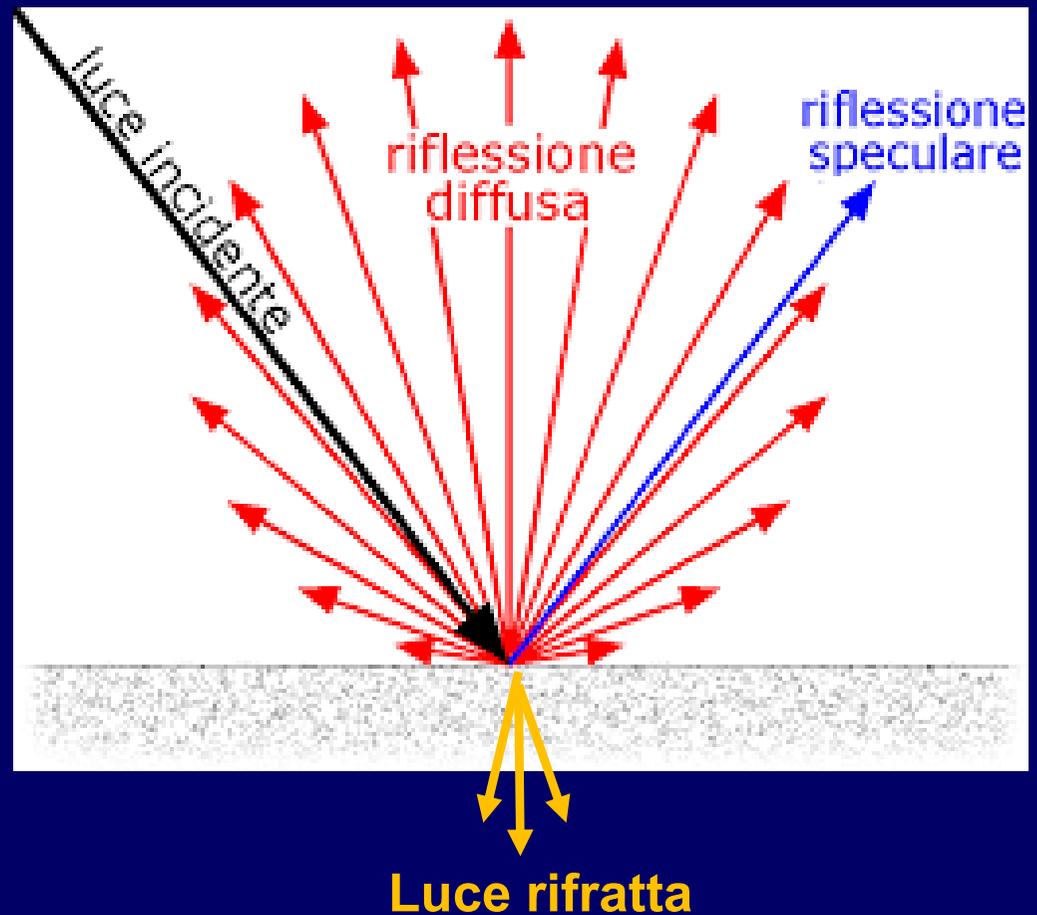
RIFERIMENTO e CAMPIONE

Luce ordinaria	Luce laser
 <p>Lampadina</p>	 <p>Laser</p>
 <p>Lunghezze d'onda non uniformi</p>	 <p>Lunghezze d'onda uniformi</p>
 <p>Fase non uniforme</p>	 <p>Picchi e avvallamenti sono allineati.</p>



PROPAGAZIONE DELLA LUCE

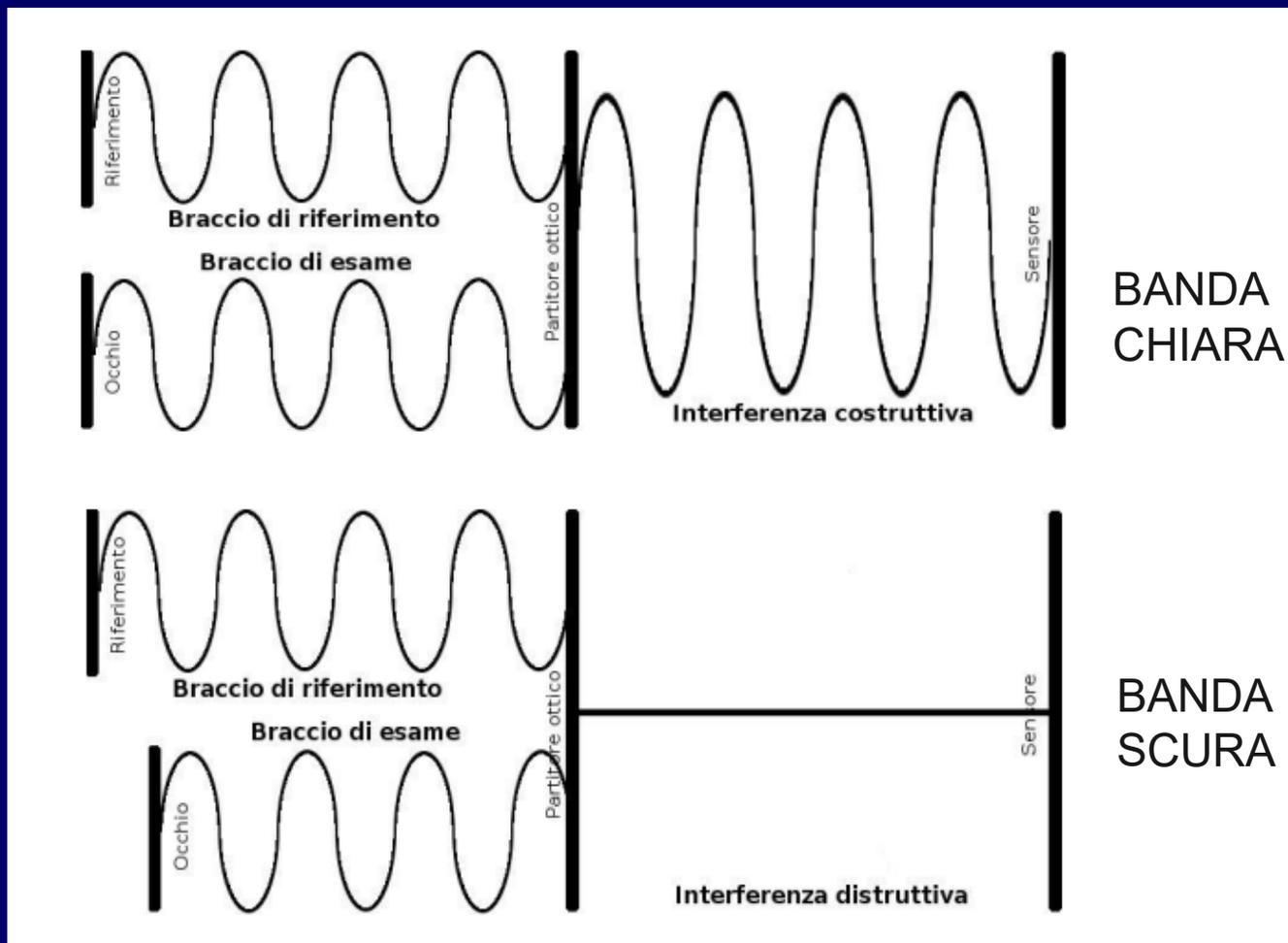
- ASSORBITA
- RIFRATTA
- RIFLESSA
 - SPECULARE
 - DIFFUSA



INTERFERENZA

COSTRUTTIVA (COERENTE): l'onda risultante ha ampiezza pari alla somma delle due onde

DISTRUTTIVA: l'onda risultante ha un'ampiezza pari a zero

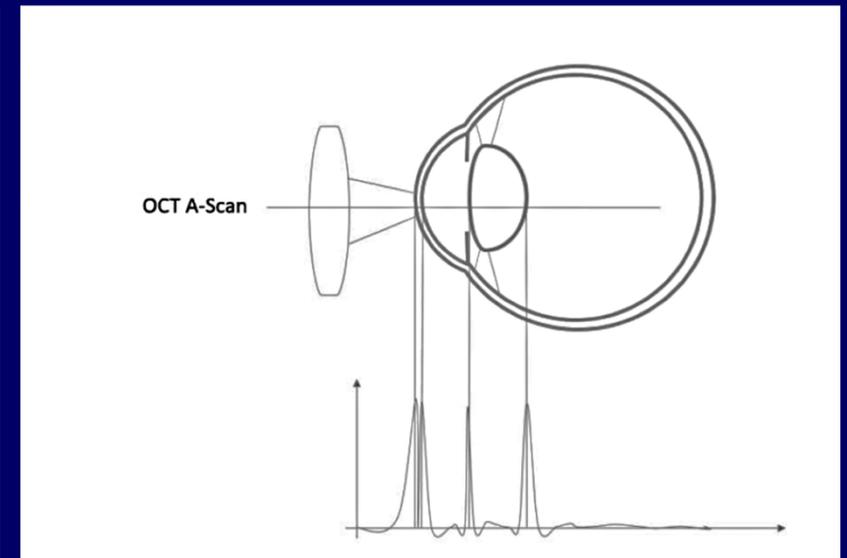
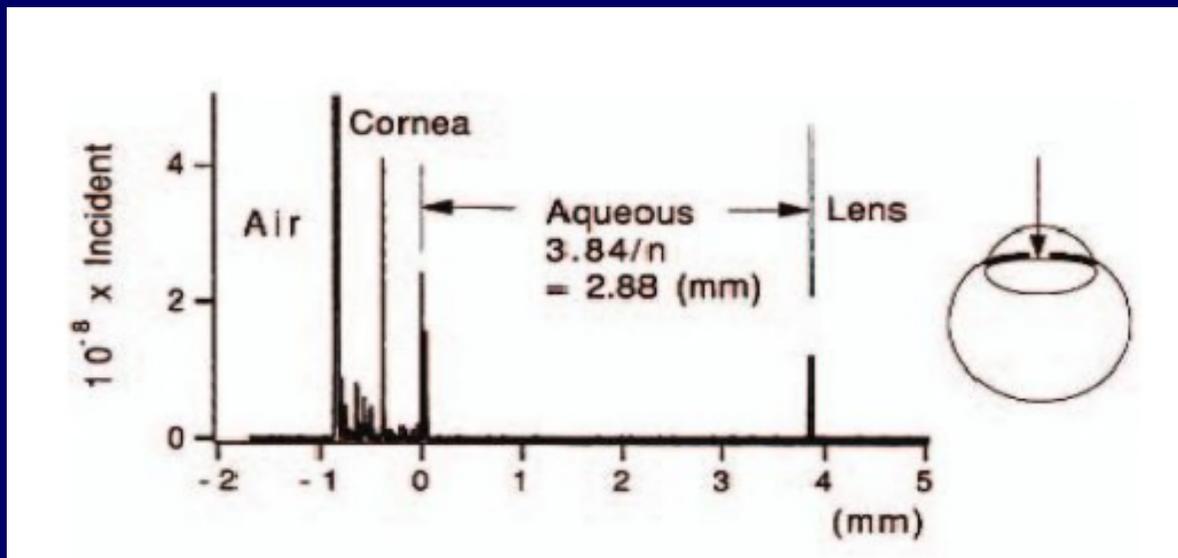


LUCE SPECULARE

LUCE DIFFUSA

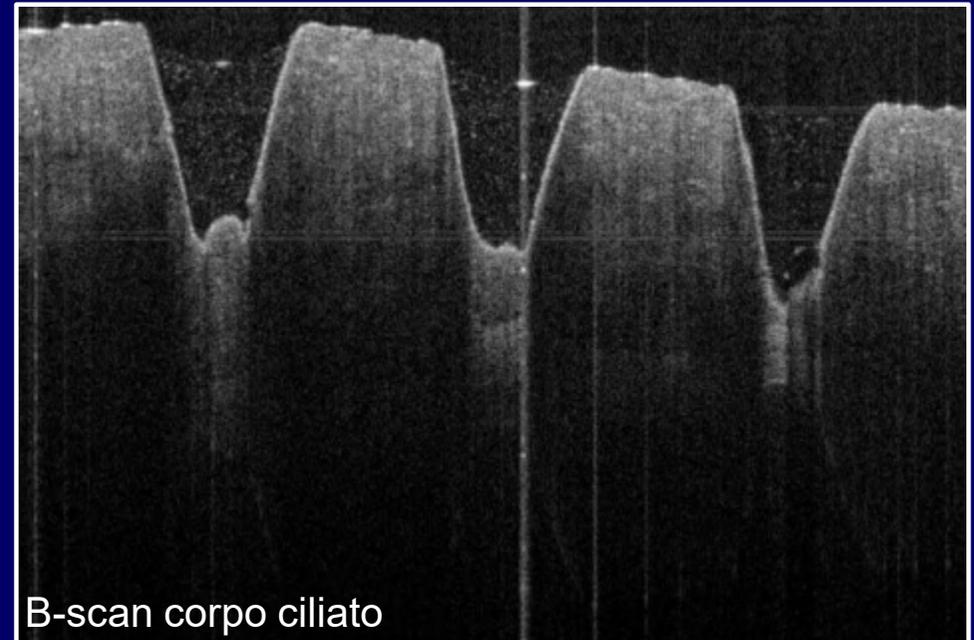
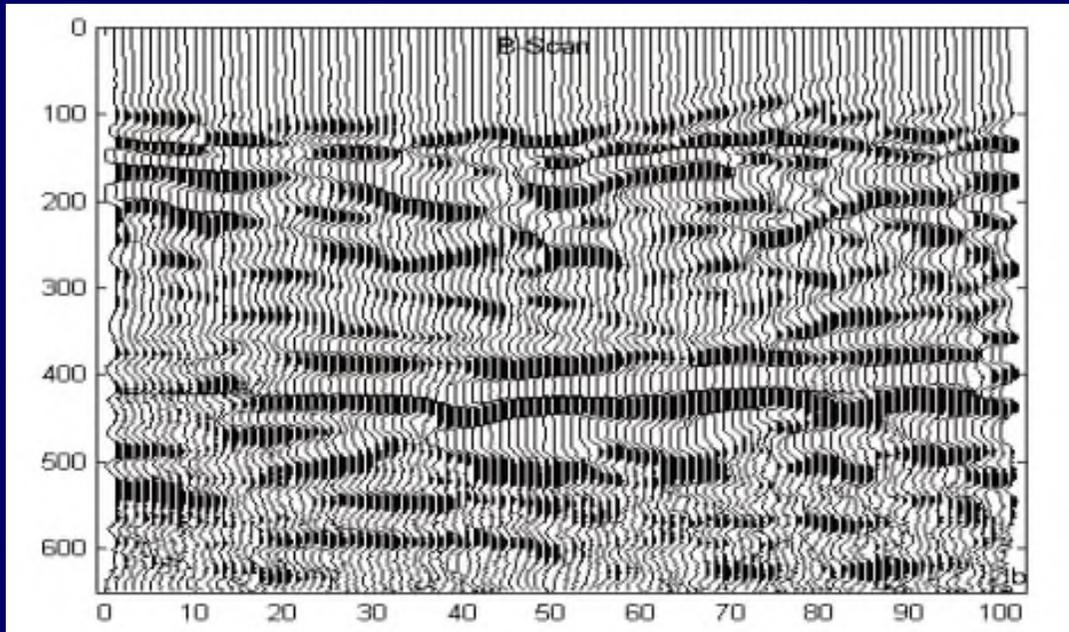
PRODUZIONE DELL'IMMAGINE

- **A-SCAN**: tracciato monodimensionale, analizza la riflettività delle strutture per calcolare la distanza (ampiezza segnale-tempo/spazio)



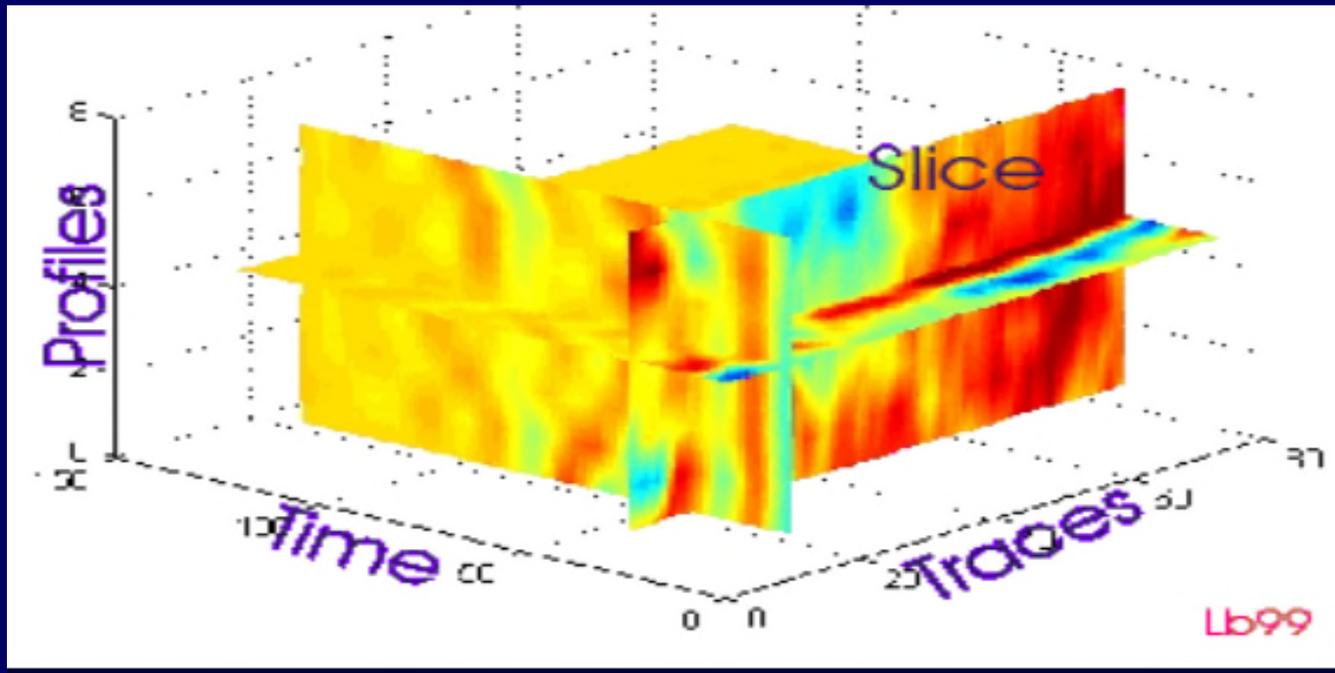
PRODUZIONE DELL'IMMAGINE

- **B-SCAN**: immagine formata da insieme di A-scan, trasformata in **scala di grigi** sulla base della diversa riflettenza degli **strati** che compongono il tessuto



PRODUZIONE DELL'IMMAGINE

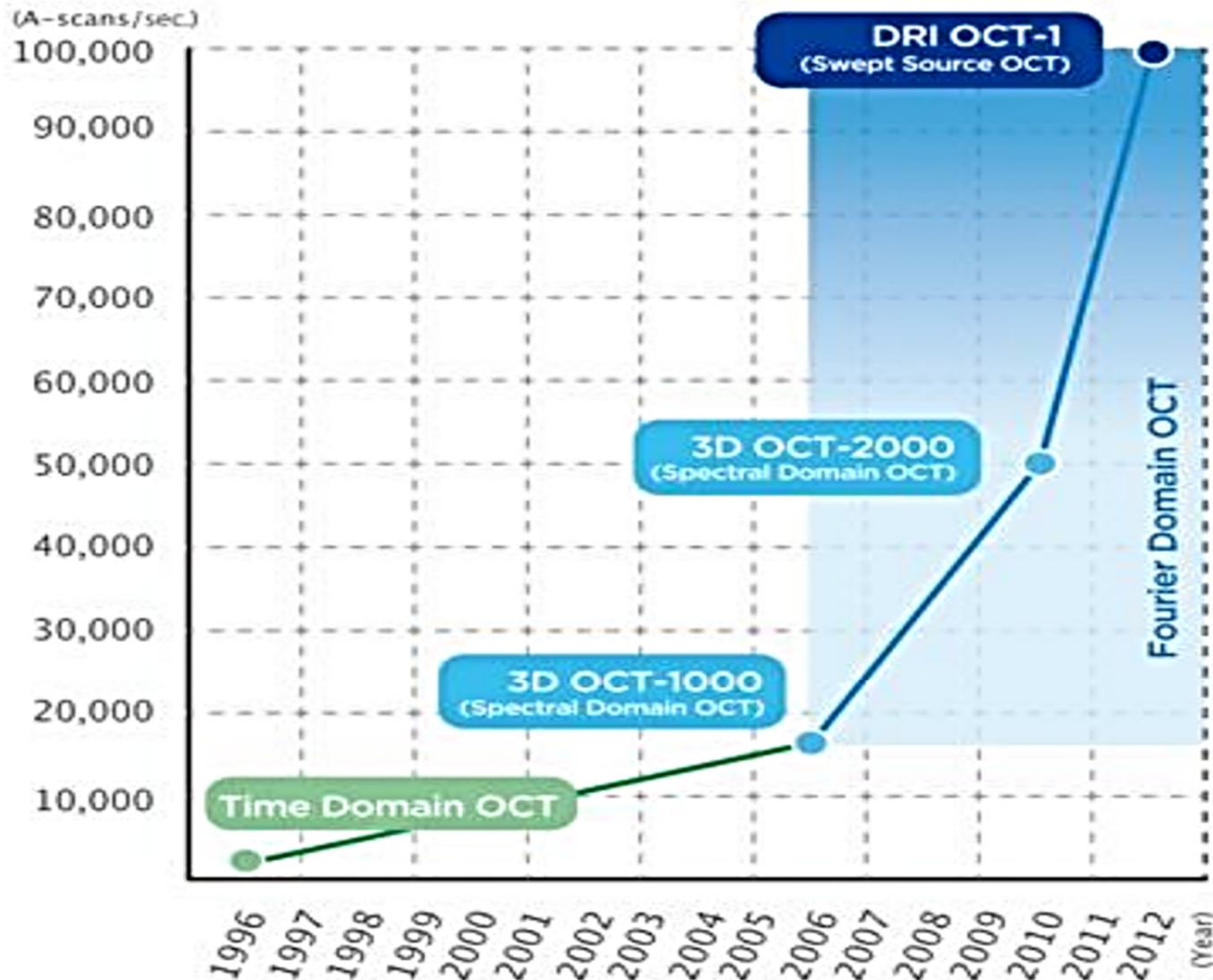
- **C-SCAN**: immagine formata da insieme di B-scan disposti in uno **spazio tridimensionale**, raffigurando l'immagine in **voxel colorati** sulla base della **diversa riflettenza** degli strati che compongono il tessuto



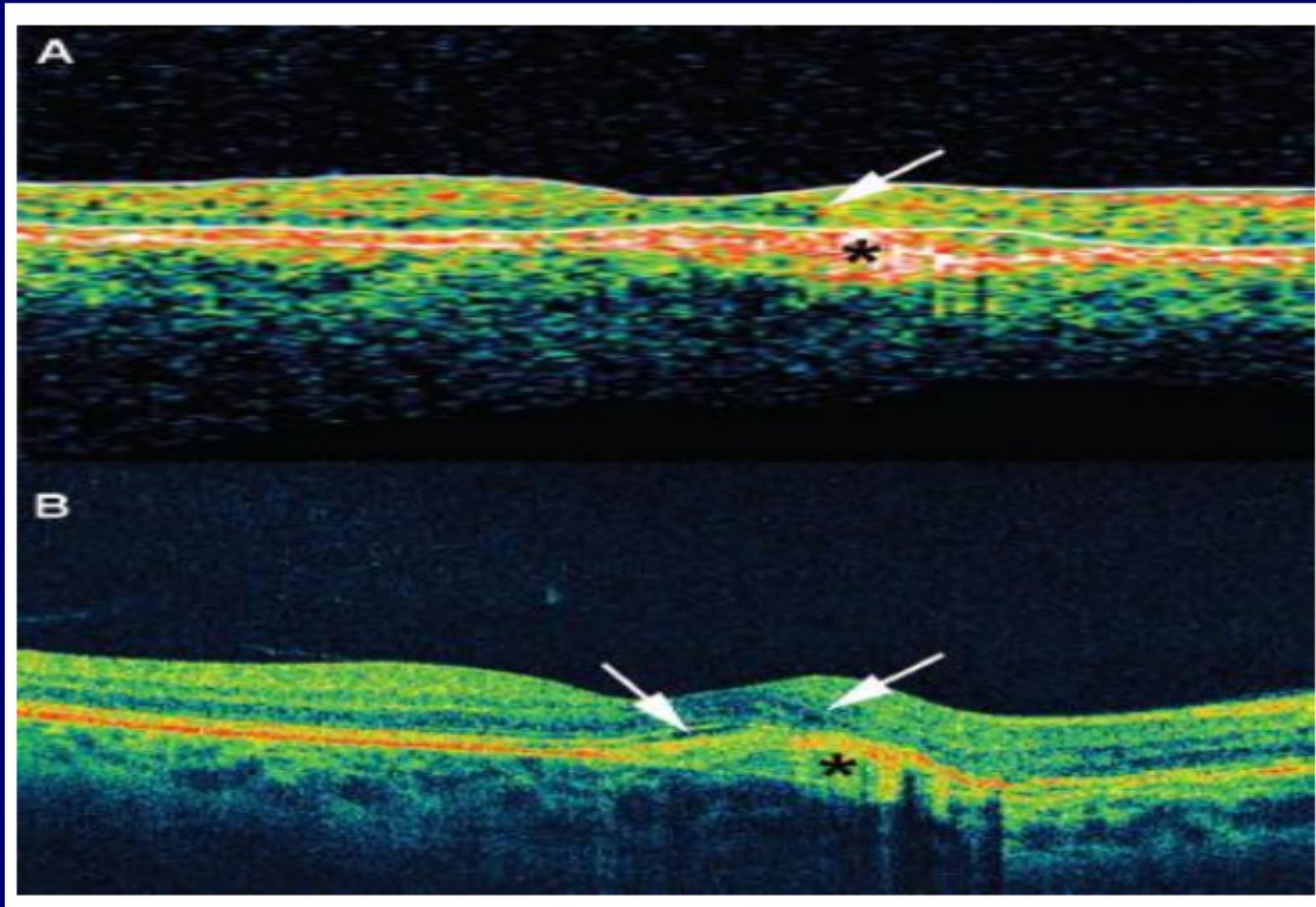
FOURIER (SPECTRAL) DOMAIN

- Rilevatore: **spettrofotometro**
- Rileva le variazioni spettrali del segnale a diverse profondità (sensibilità)
- Analisi di Fourier => A-B-C scan
- **VANTAGGI:**
 - Aumento frequenza delle scansioni (A-scan/s)
 - Riduzione tempi di esecuzione
 - Aumento sensibilità

FOURIER (SPECTRAL) DOMAIN



FOURIER (SPECTRAL) DOMAIN

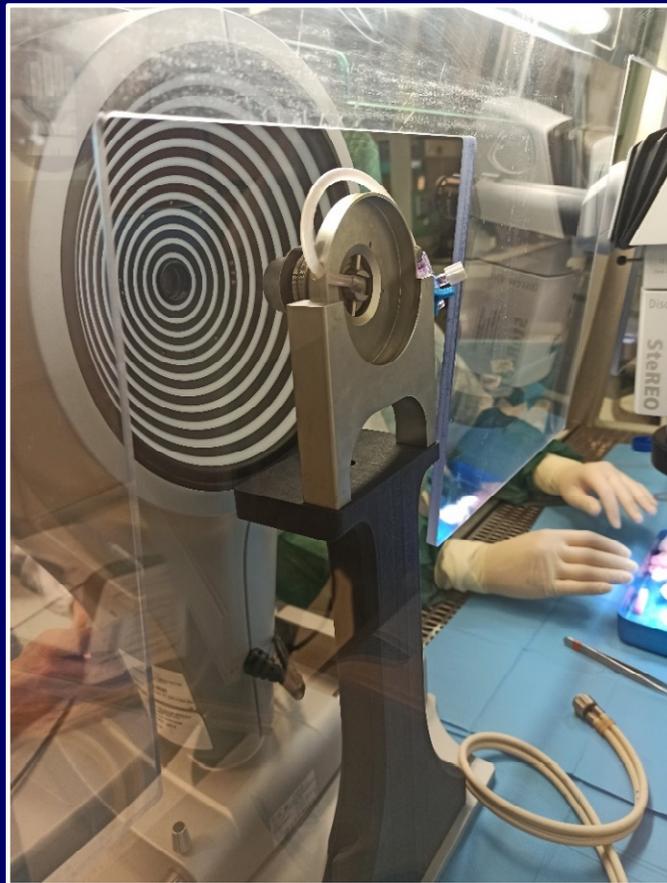


TD OCT

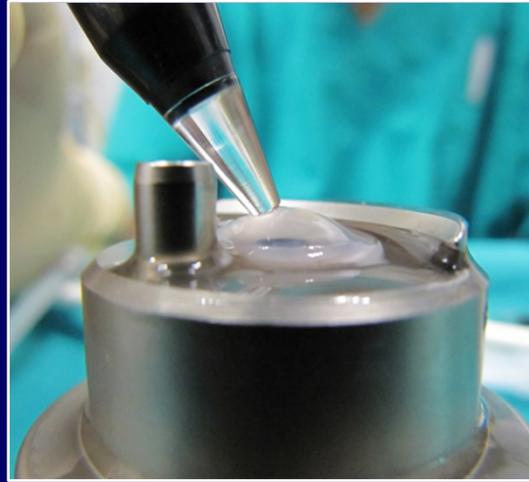
F(S)D OCT

EYE BANK

- LENTICULES PREPARATION
- QUALITY CONTROL
- TISSUES SELECTION

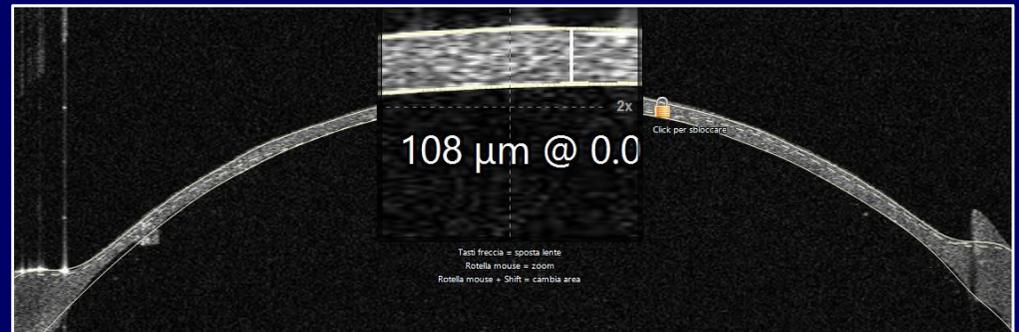
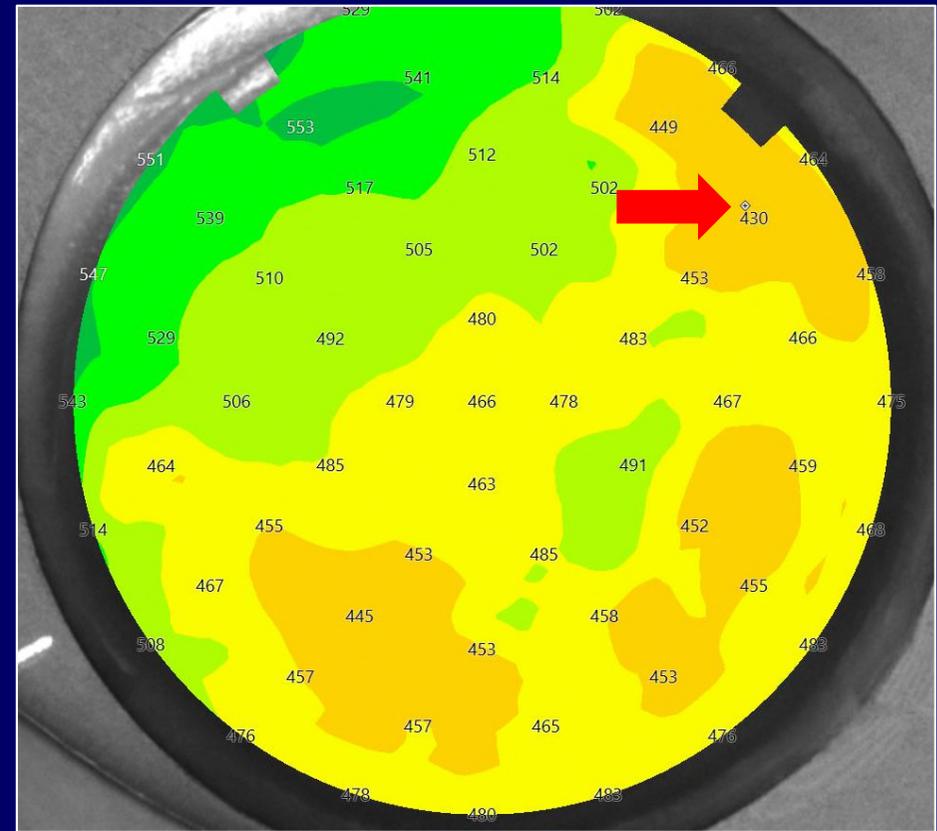


PACHIMETRIA ULTRASUONI vs OCT



2010

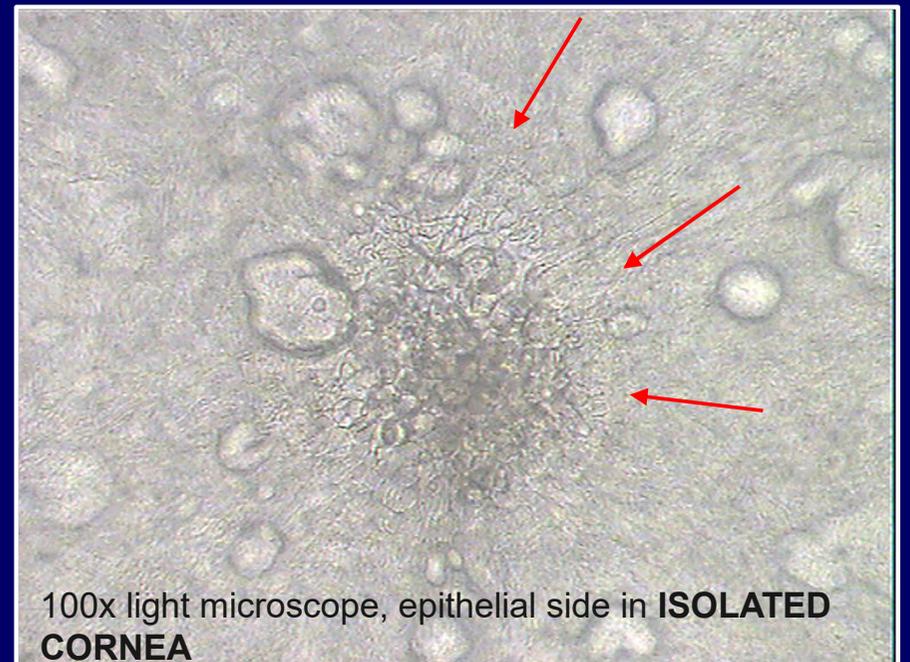
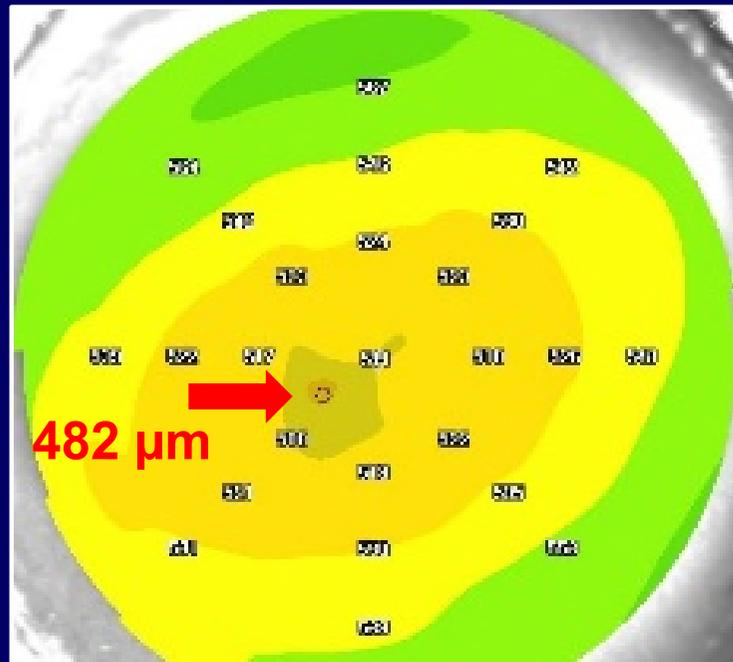
153,94 ± 26,27 μm (n=111)



2013

111 ± 25 μm (n=573)

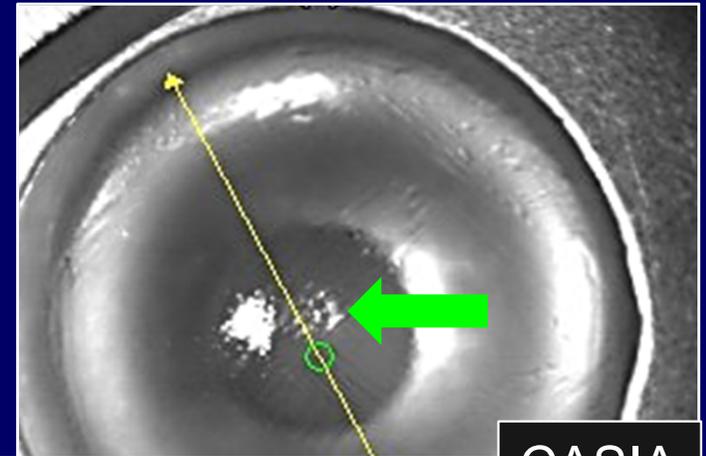
CORNEAL SCARS



CORNEAL SCARS

DSAEK: depends on the depth

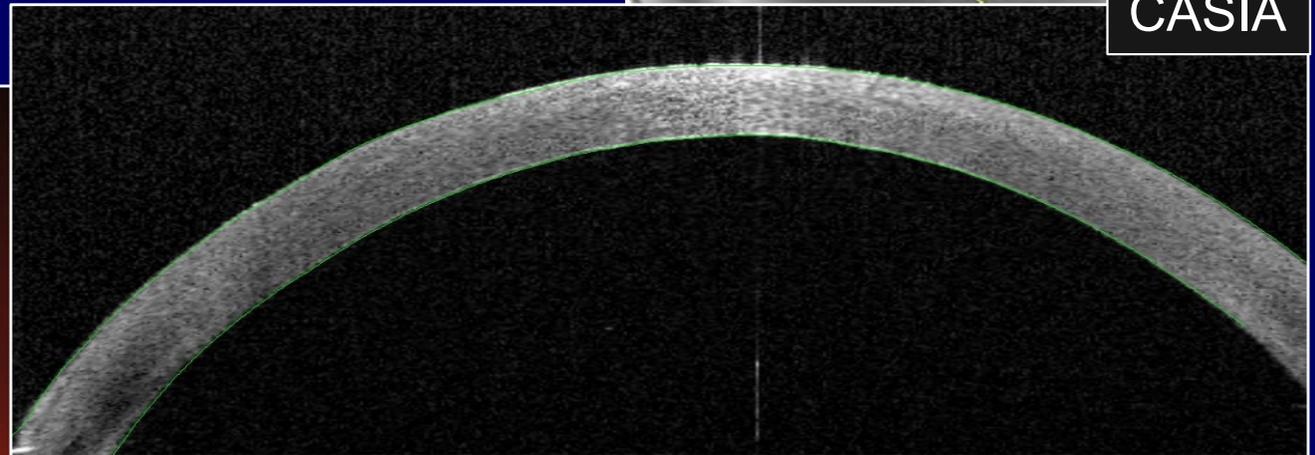
DMEK: Ok



CASIA



Slit lamp, **ISOLATED CORNEA**
In Coldix



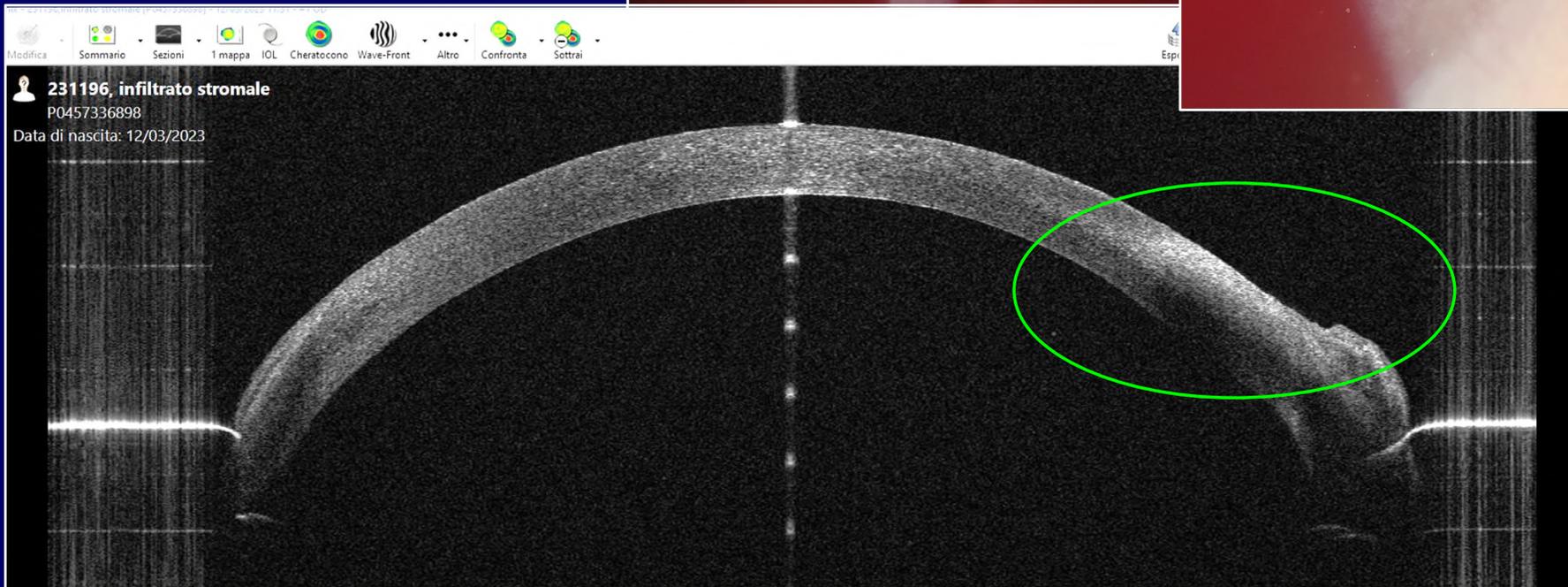
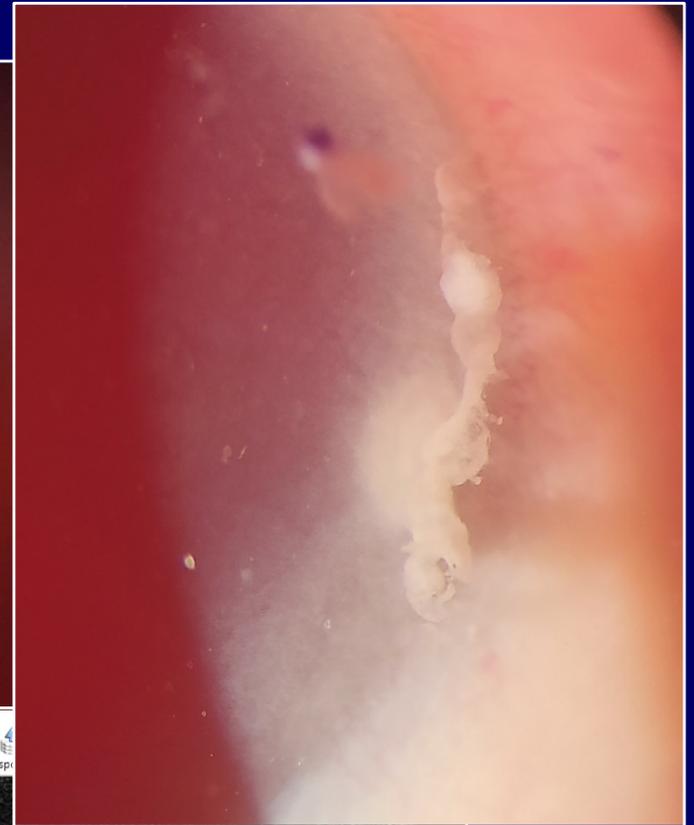
MS-39



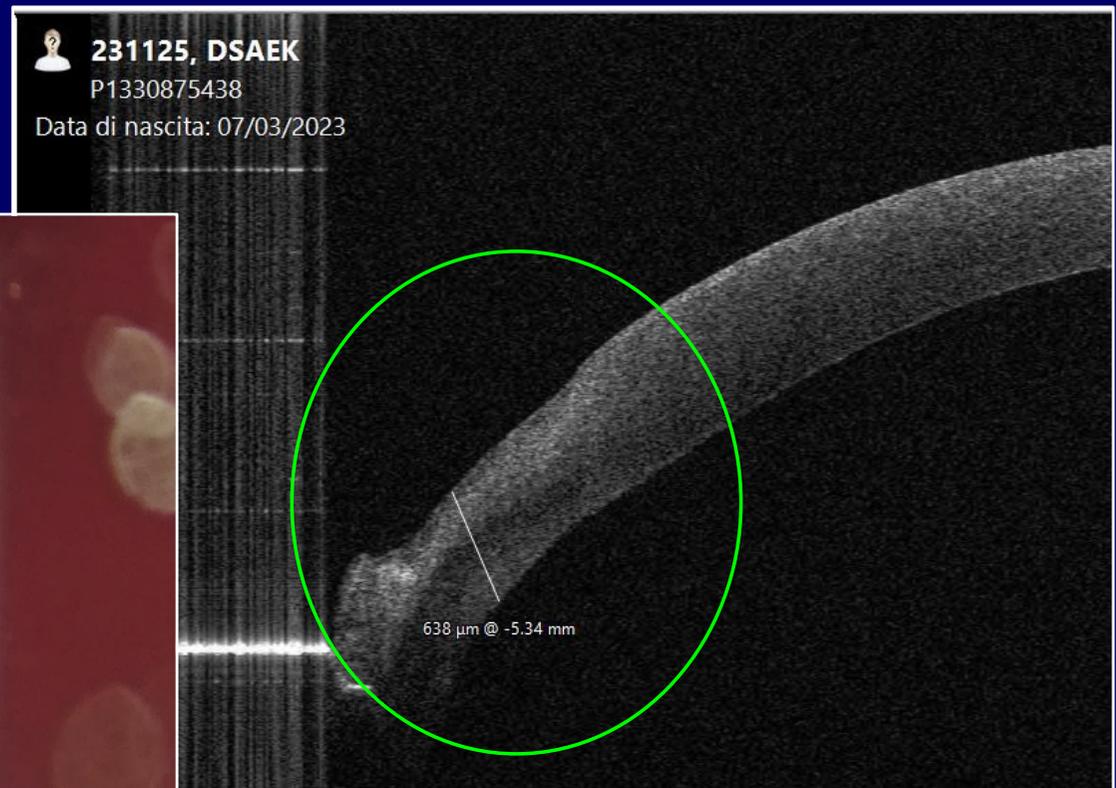
231122, dsek
P1726704503
Data di nascita: 07/03/2023

STROMAL DEFECTS

- INFILTRATES
- SCARS
- For DSEAK

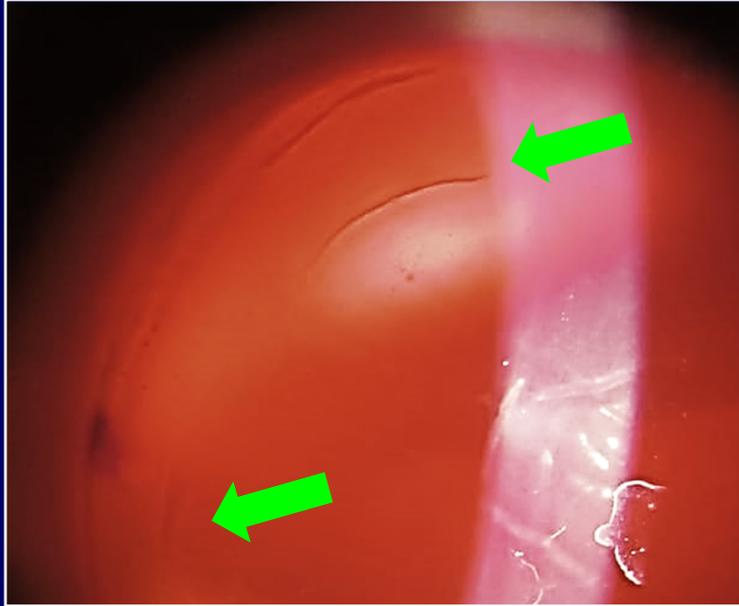


STROMAL DEFECTS

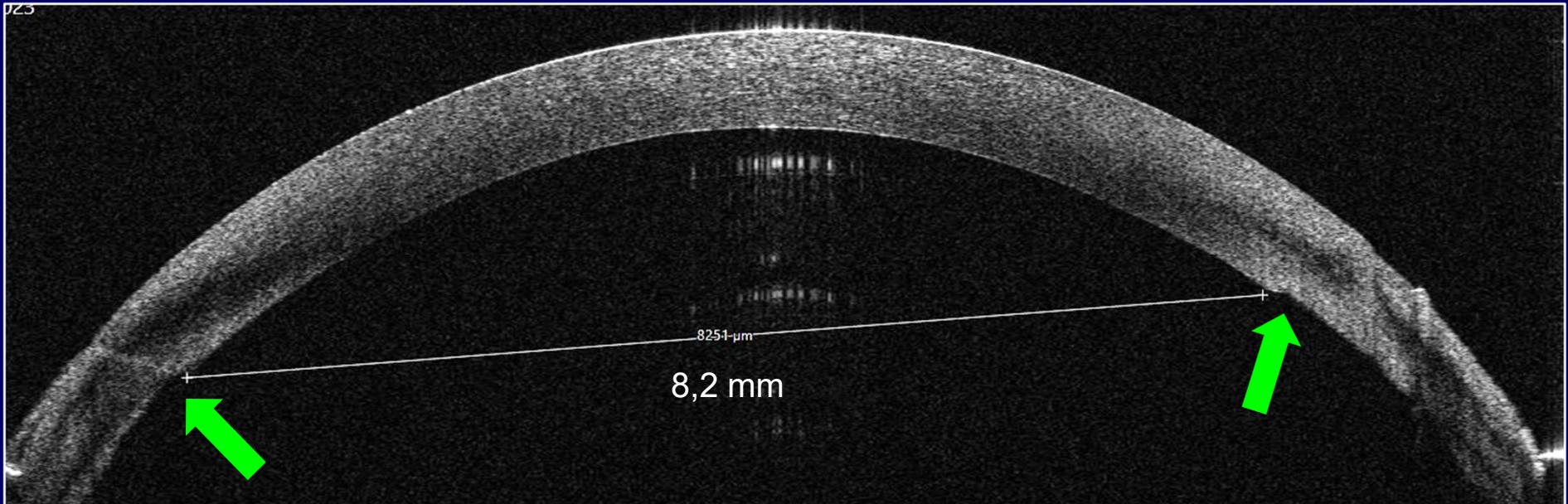


- INFILTRATES
- ULCERS
- For DMEK

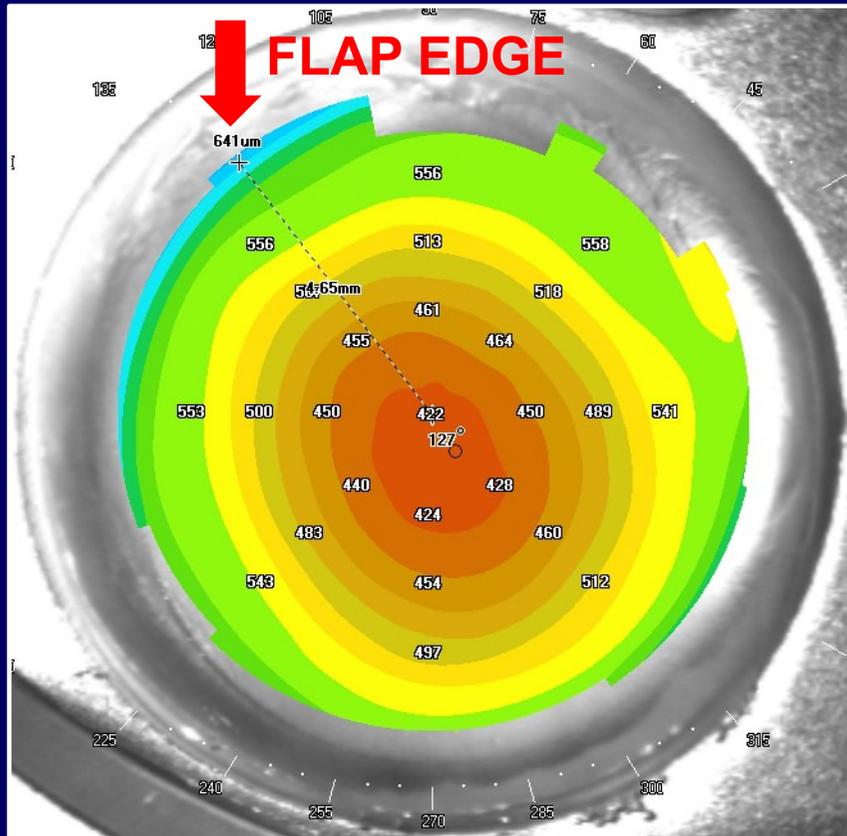
CATARACT SURGERY



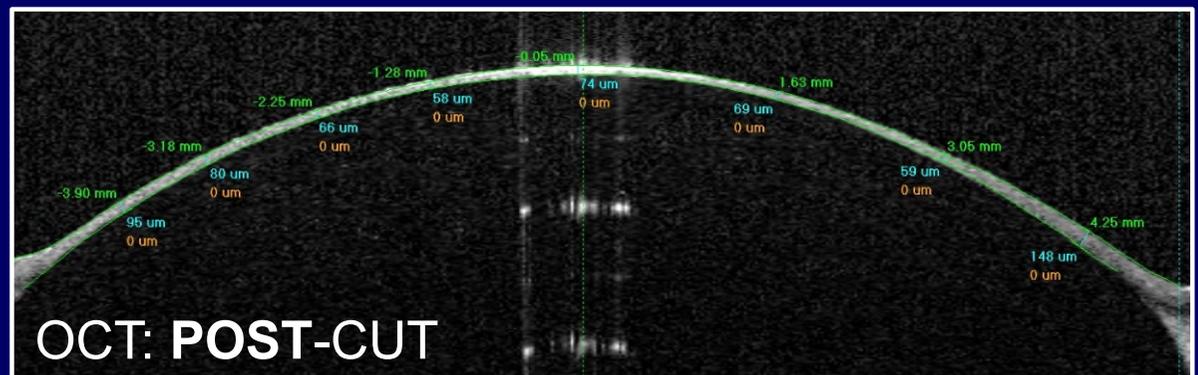
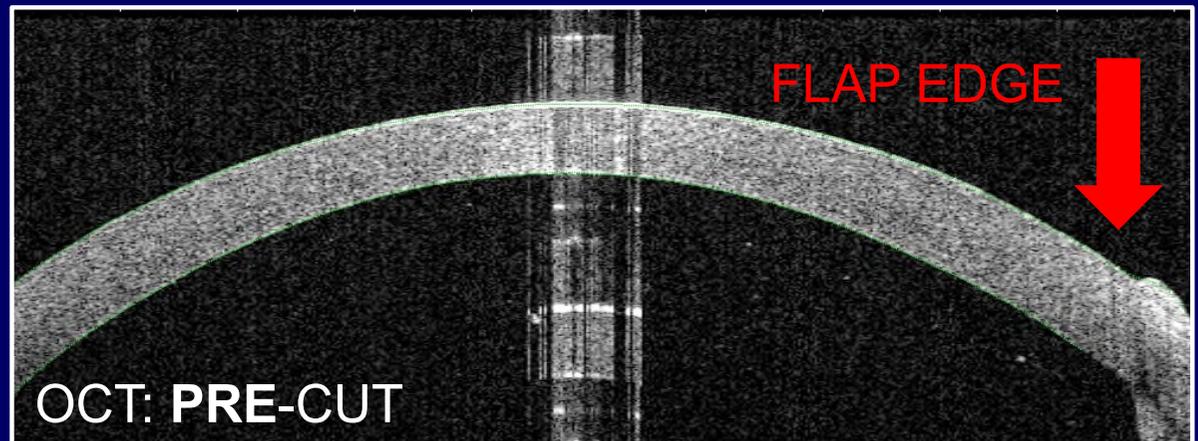
- NO DSAEK
- DMEK?



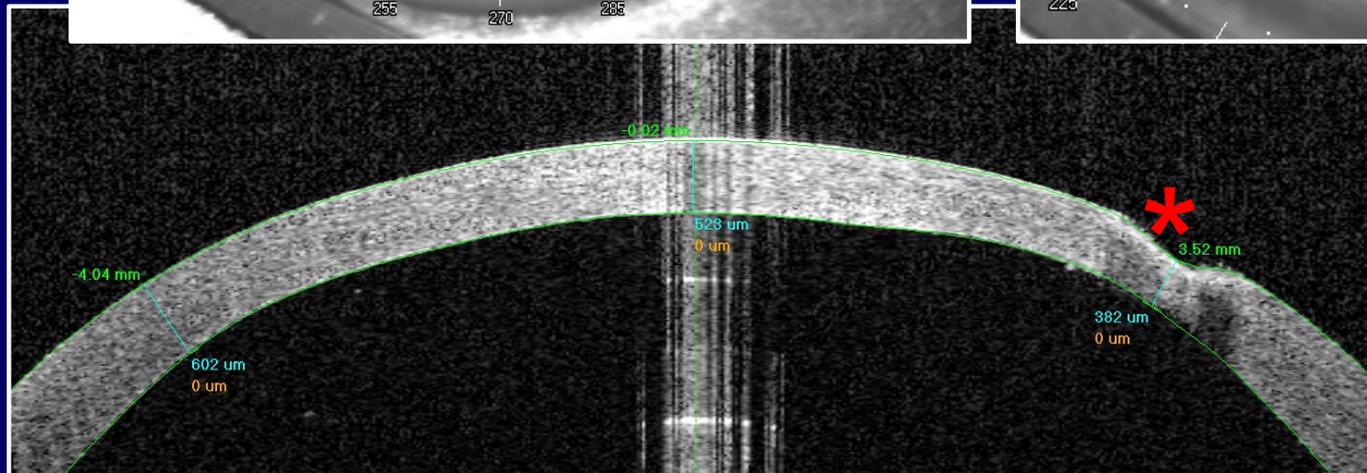
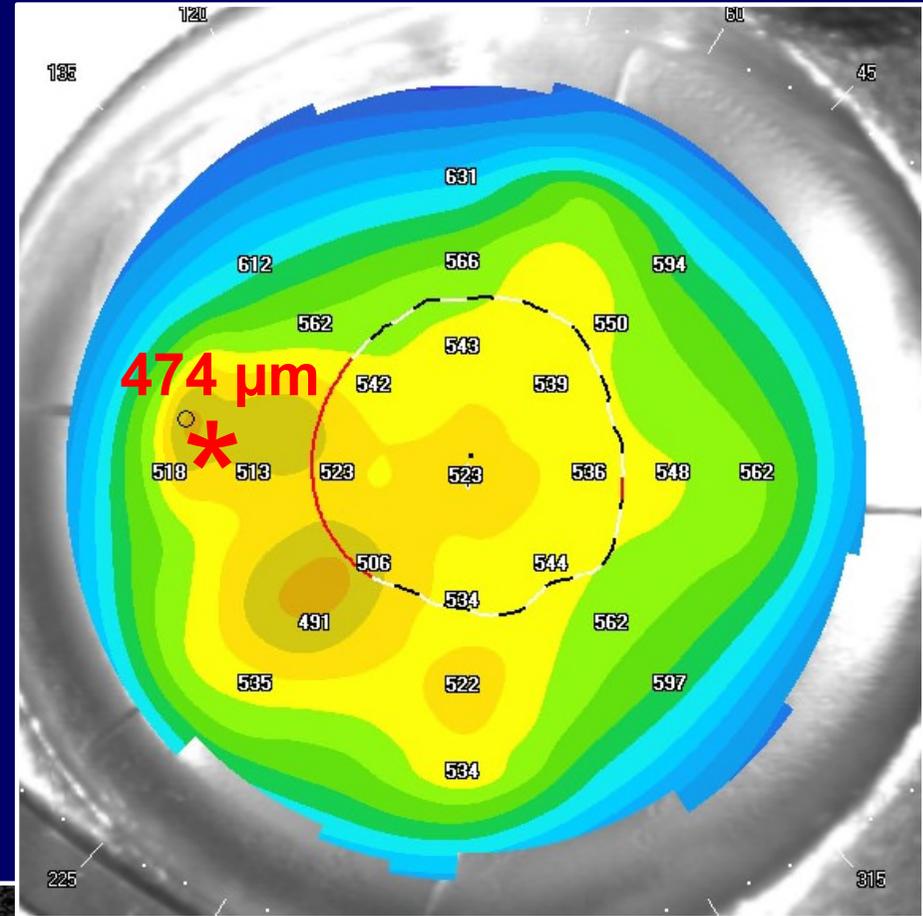
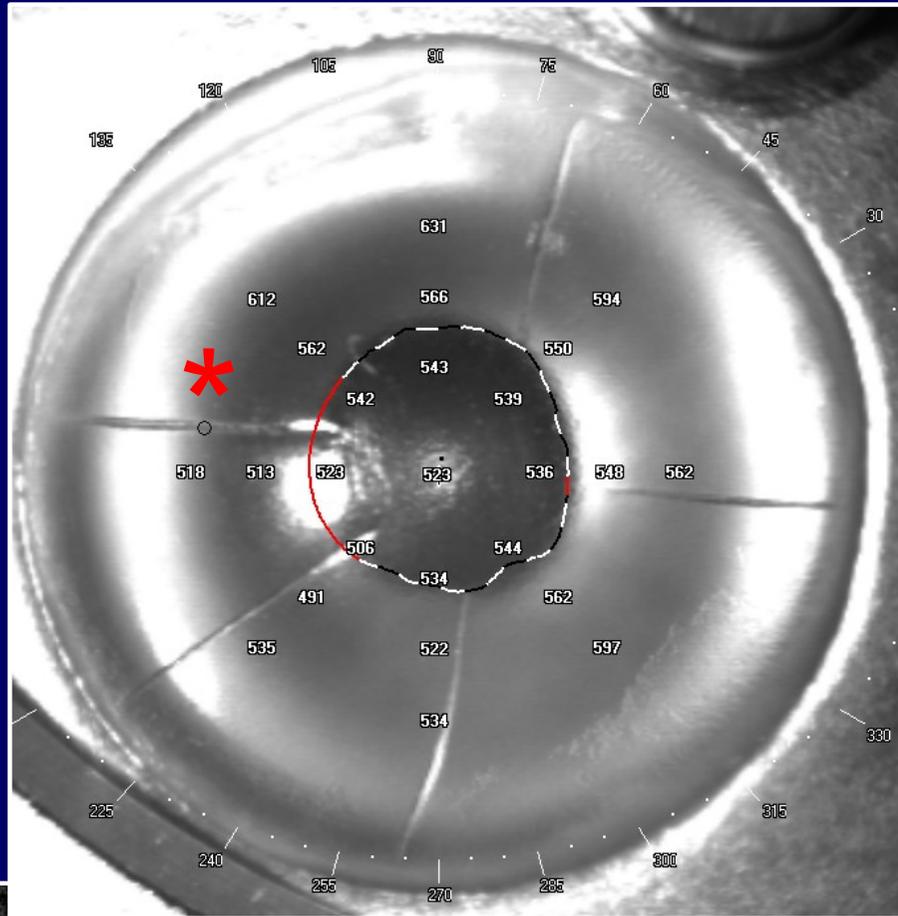
LASIK/PRK



DSAEK: YES, depends from the stroma thickness before cut



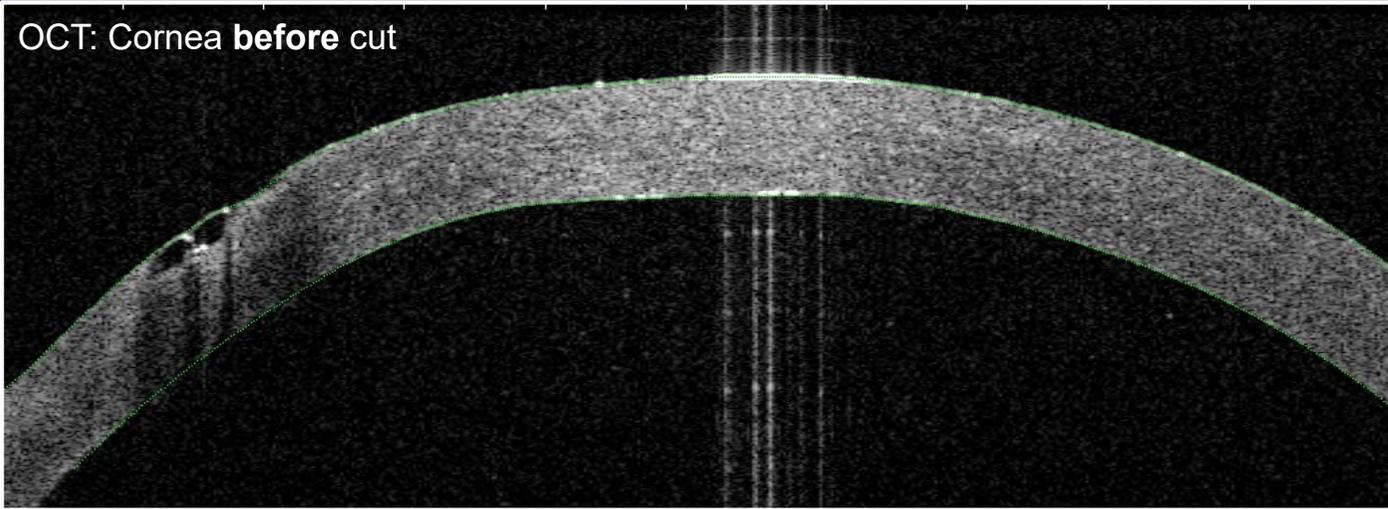
RADIAL KERATOTOMY



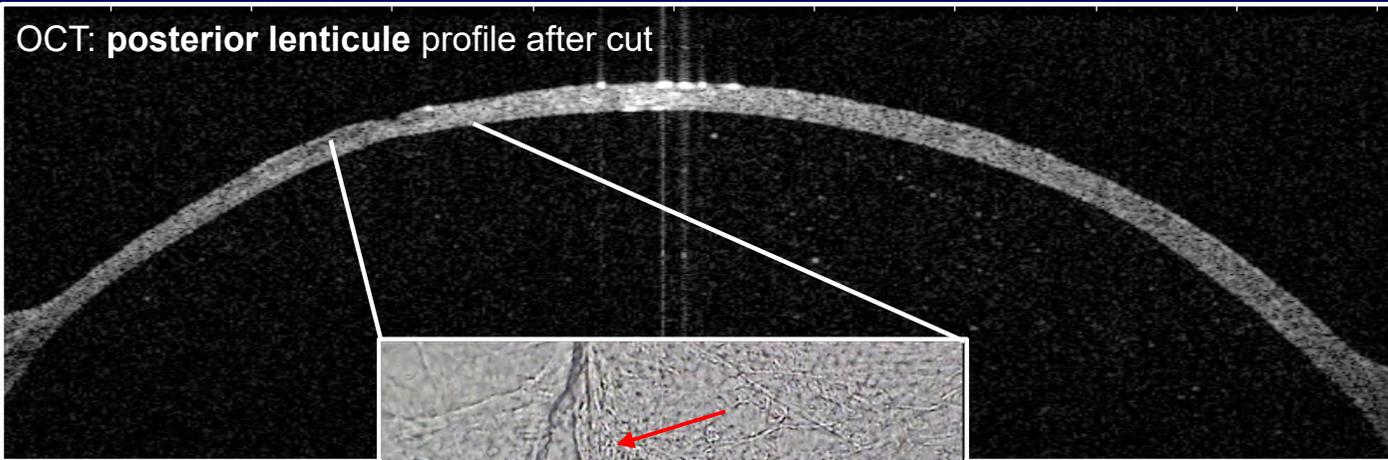
* Thinnest point detected

RADIAL KERATOTOMY

OCT: Cornea before cut



OCT: posterior lenticule profile after cut



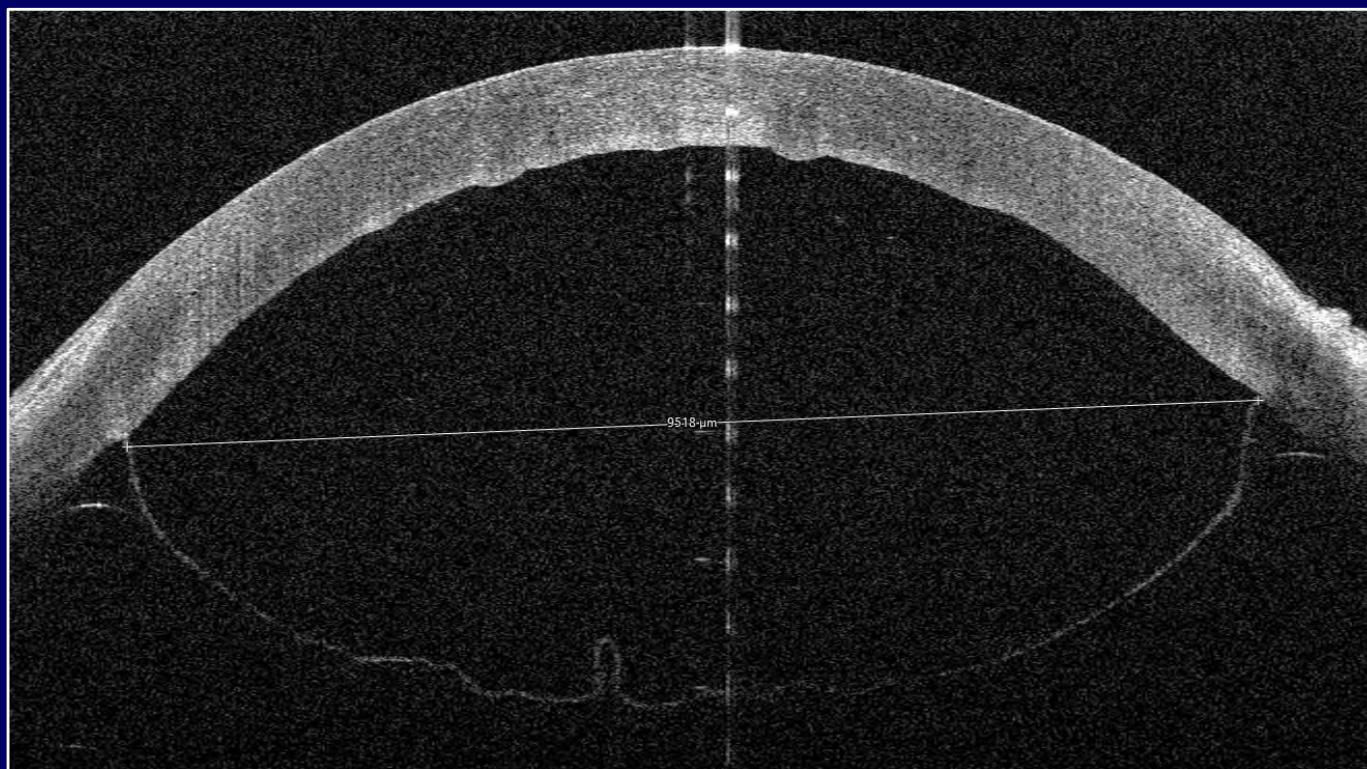
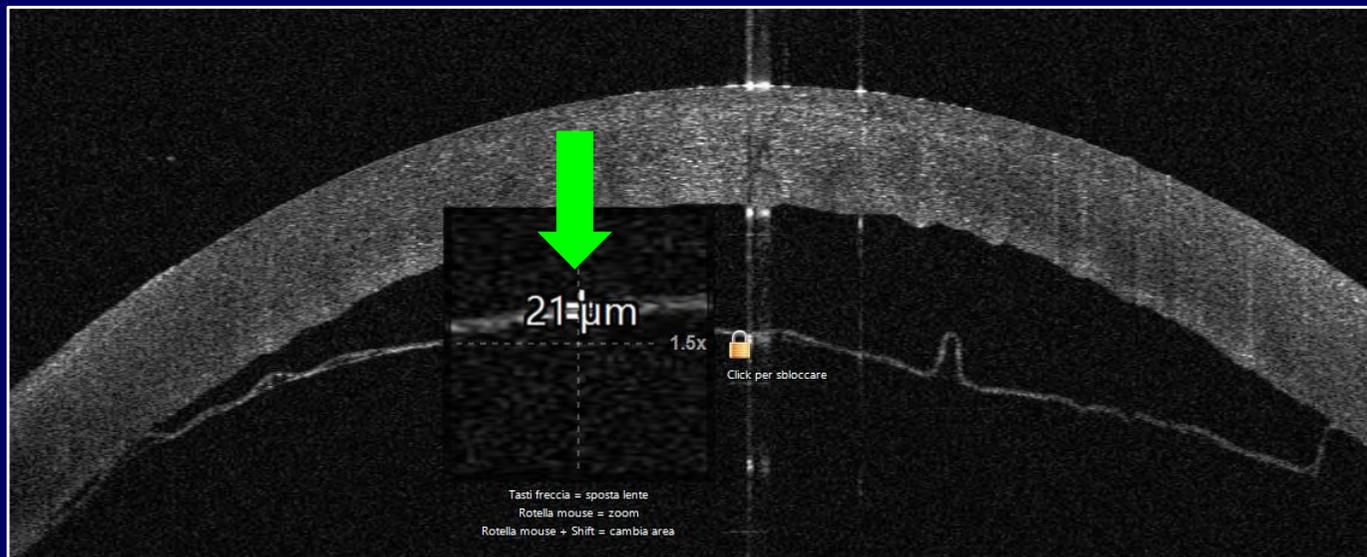
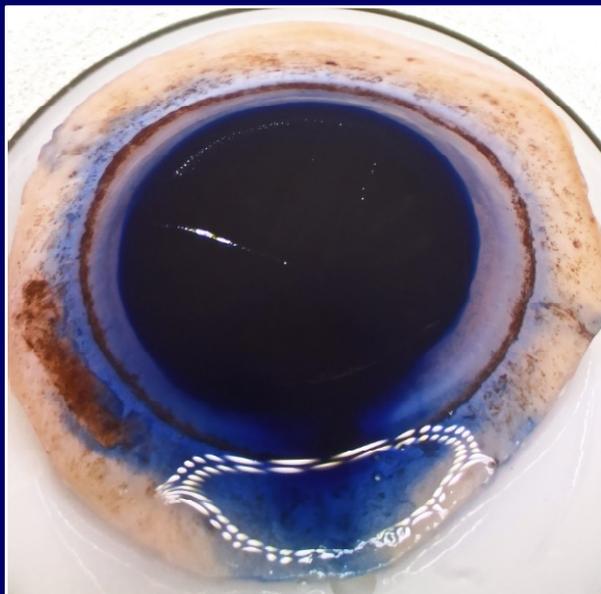
100x
light microscope.
stromal bed
incision.

Nahum, Yoav et al. "Two cases of ultrathin Descemet stripping automated endothelial keratoplasty utilizing a graft that had undergone radial keratotomy." Indian journal of ophthalmology vol. 64,2 (2016): 162-4. doi:10.4103/0301-4738.179713

DSAEK: YES, depends on the
depth of the incisions

DMEK

Type-2 bubble preparation



GRAZIE PER L'ATTENZIONE



RESEARCH



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EYE BANKING

TRAINING

