Proposed research plan

1- Synthesized femtosecond laser pulses and its applications in digital holography

2- Digital holographic shape measurement using low coherence femtosecond laser sources (running)

3- Comparison between Muller matrix 3D directional imaging and digital holographic imaging for featuring collagen fibers

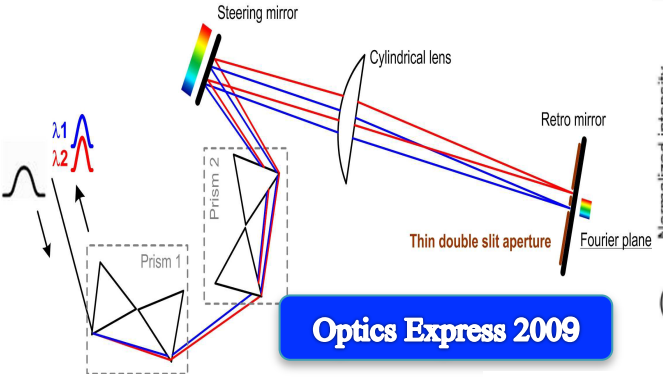
4- Multi-wavelength digital holography based on optical comb

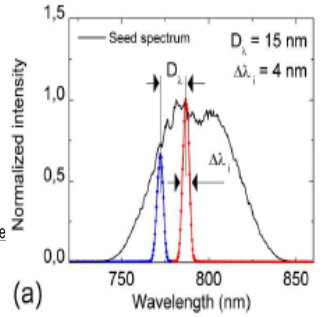
5- Strongly curved surface (or error in parallelism) measurement based on absolute distance measurement

By

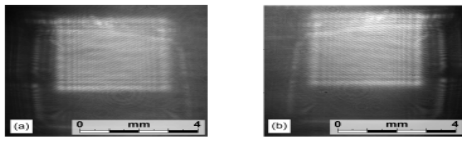
Dr. Dahi Ghareab Abdelsalam (D.G.Abdelsalam)

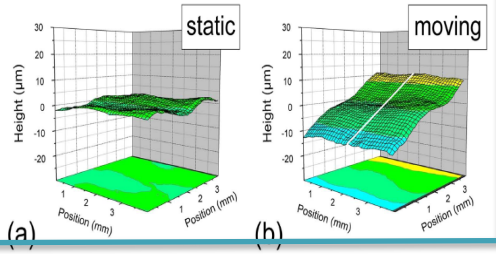
1-Synthesized femtosecond laser pulse source for two-wavelength contouring with simultaneously recorded digital holograms

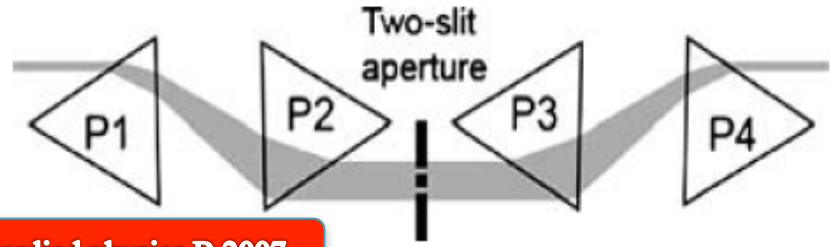




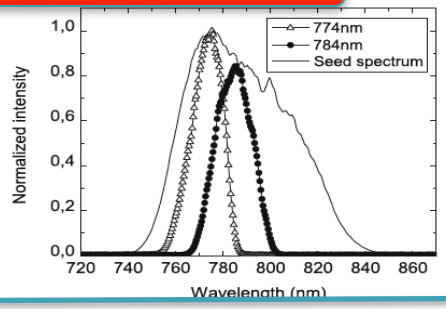
Optics Express 2009

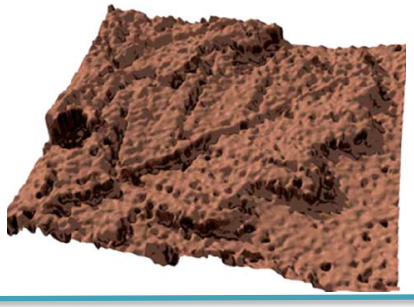


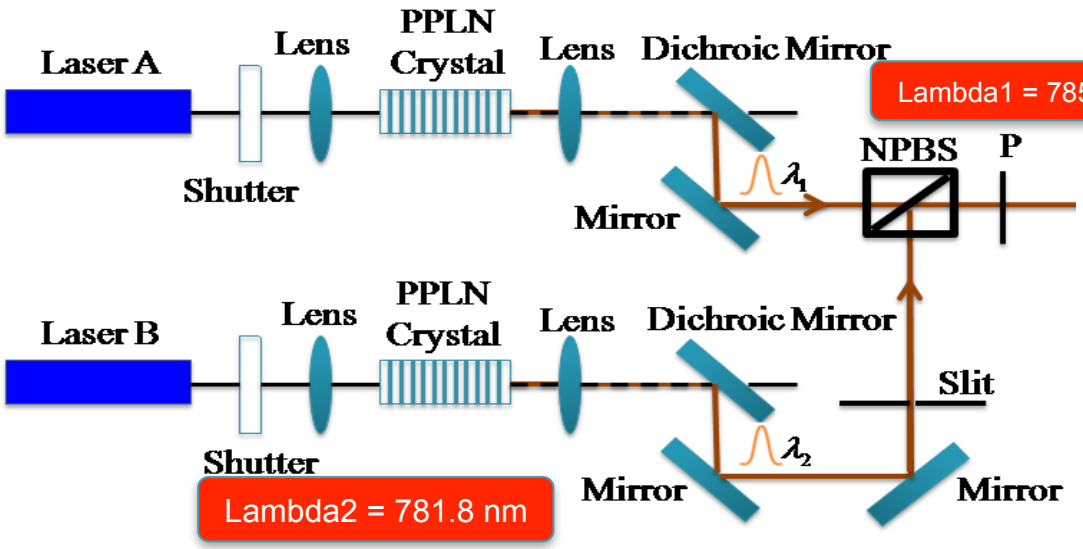




Applied physics B 2007

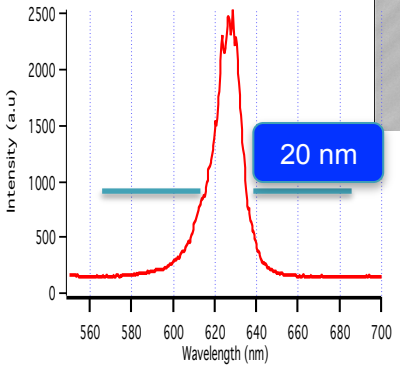


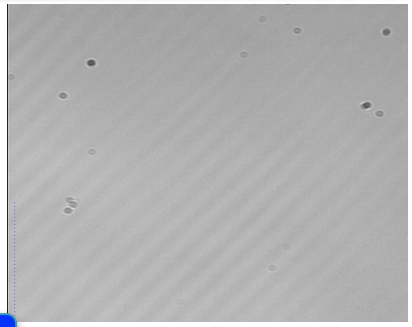




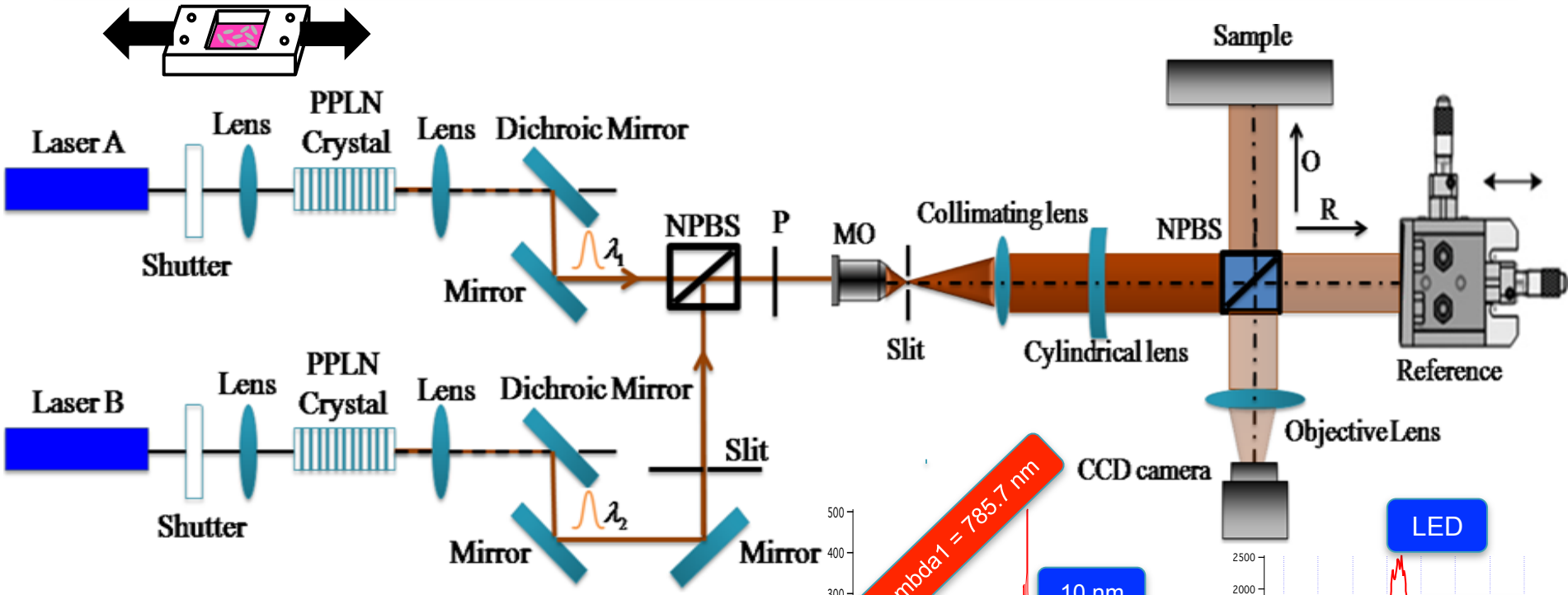
Lambda1 = 785.7 nm

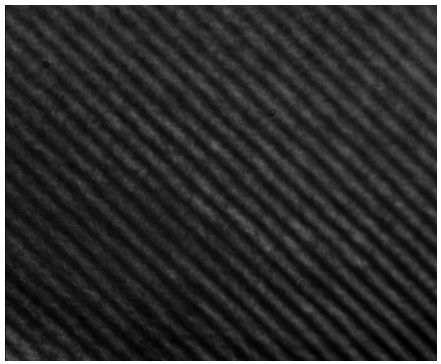
Lambda2 = 781.8 nm



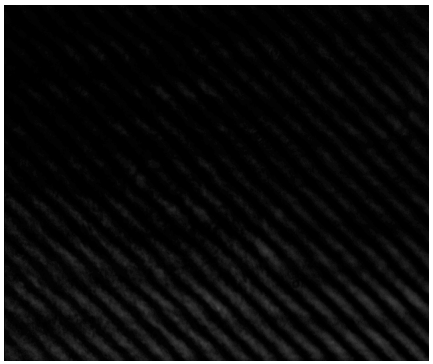


2- Digital holographic shape measurement using low coherence femtosecond laser sources (running)

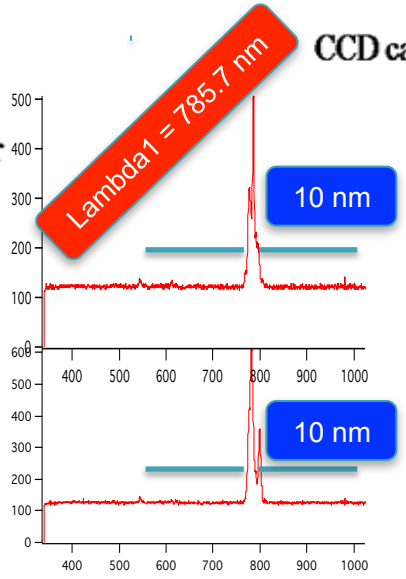




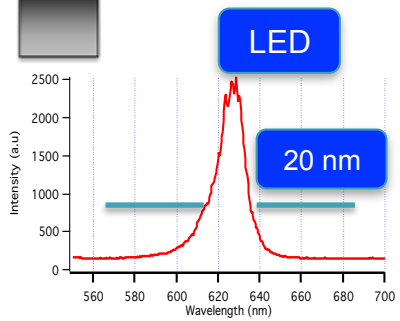
H1

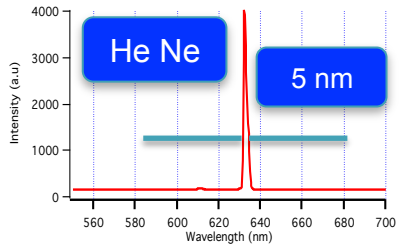


H2

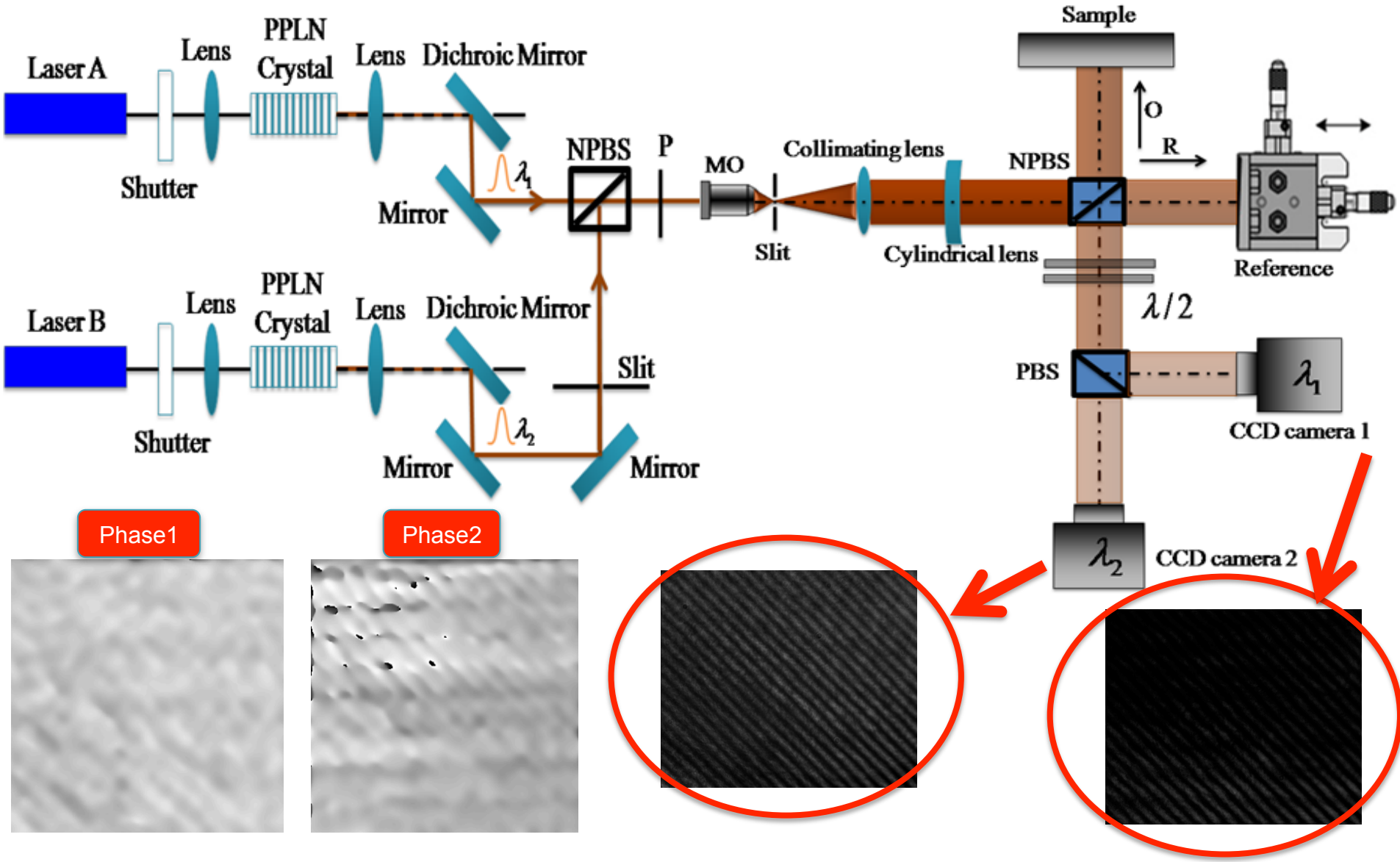


Lambda2 = 781.8 nm

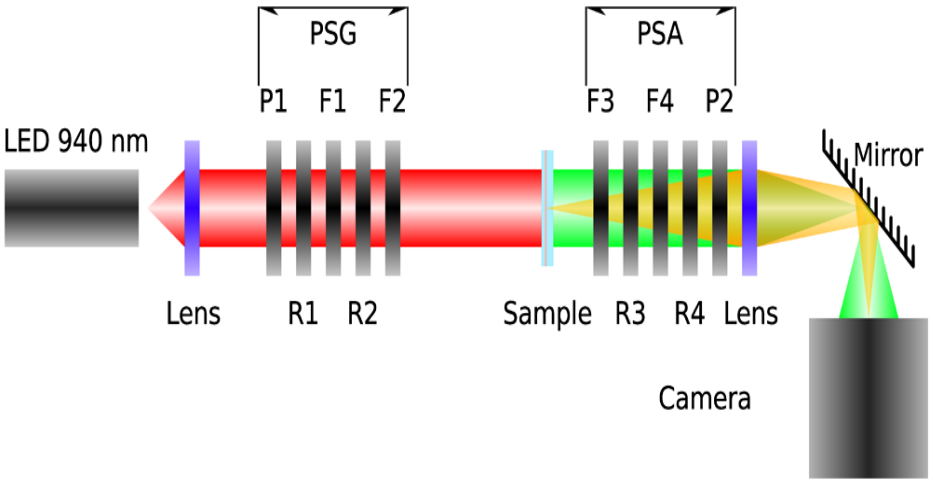


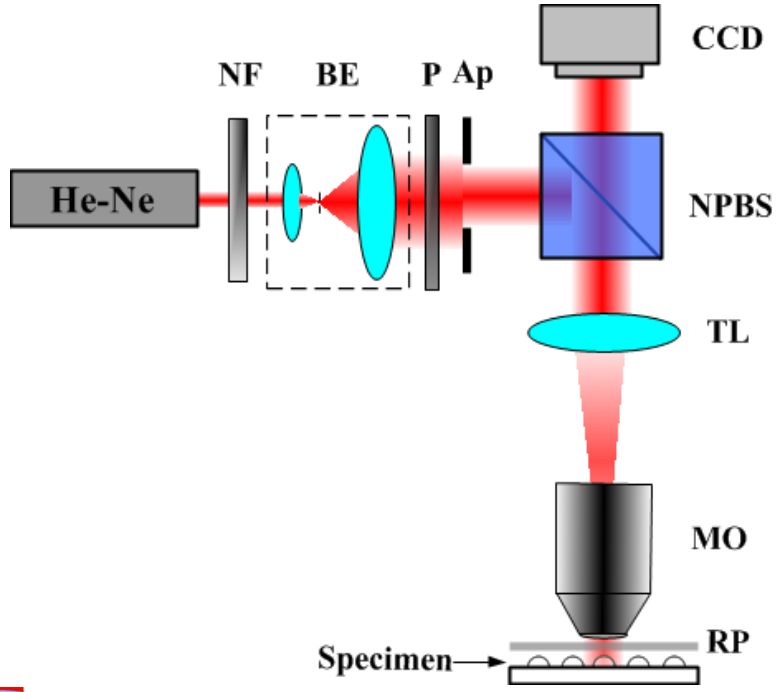


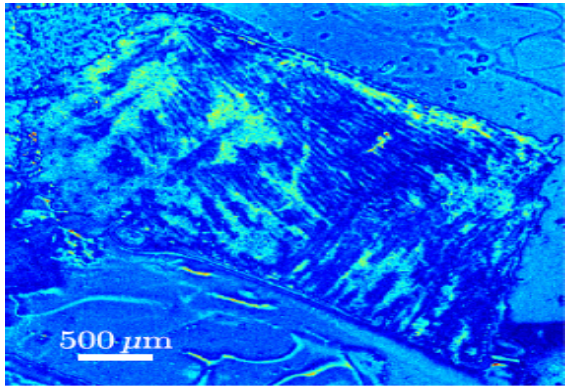
2-Surface shape measurement using low coherence lasers with simultaneously recorded digital holograms (suggested)

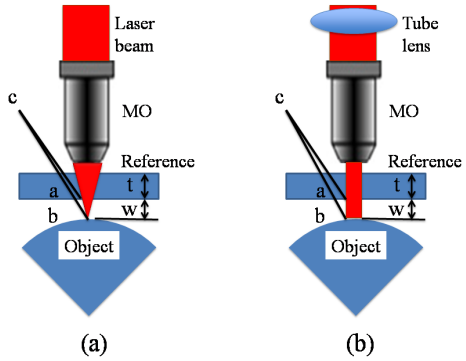


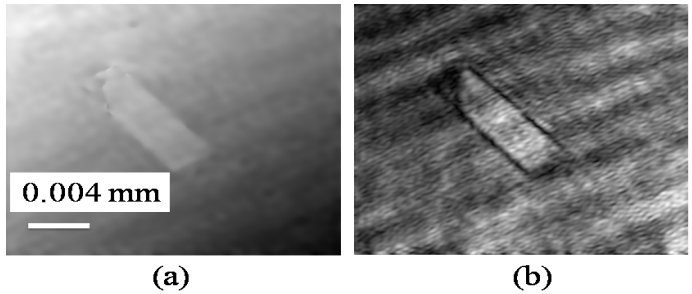
3- Comparison between Muller matrix 3D directional imaging and digital holographic imaging for featuring collagen fibers



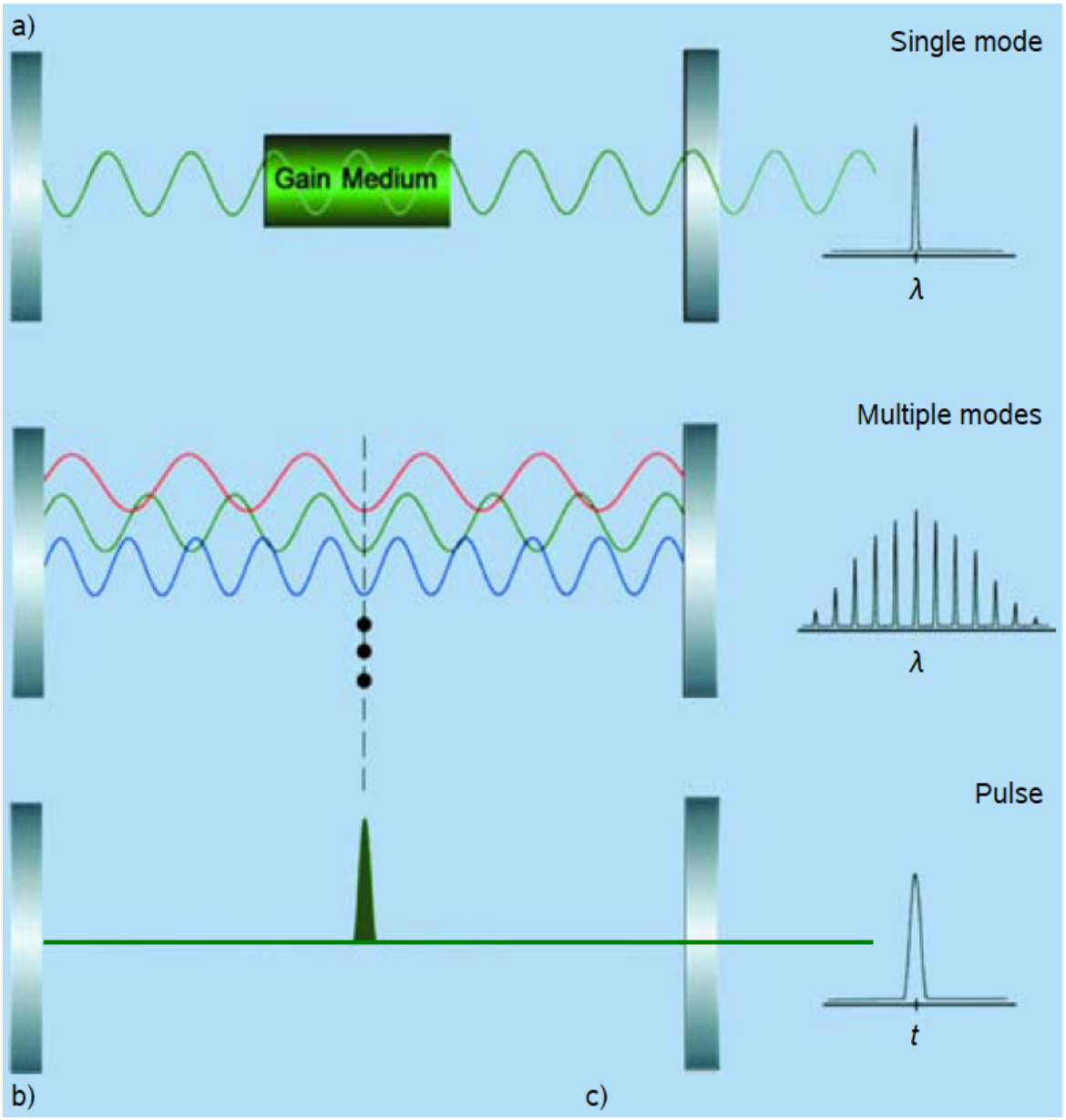


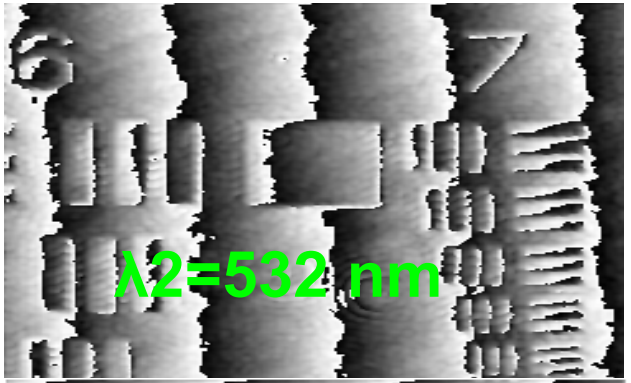


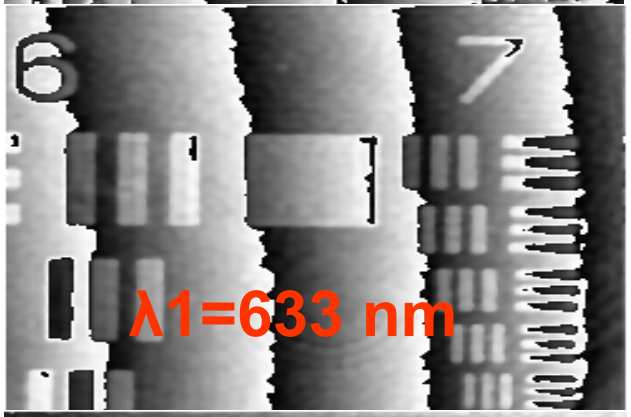


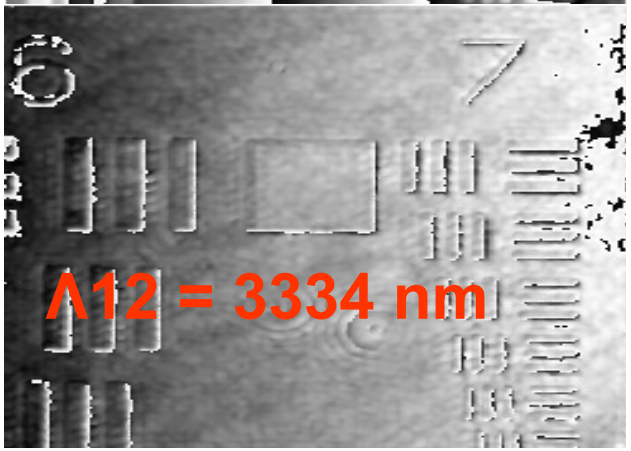


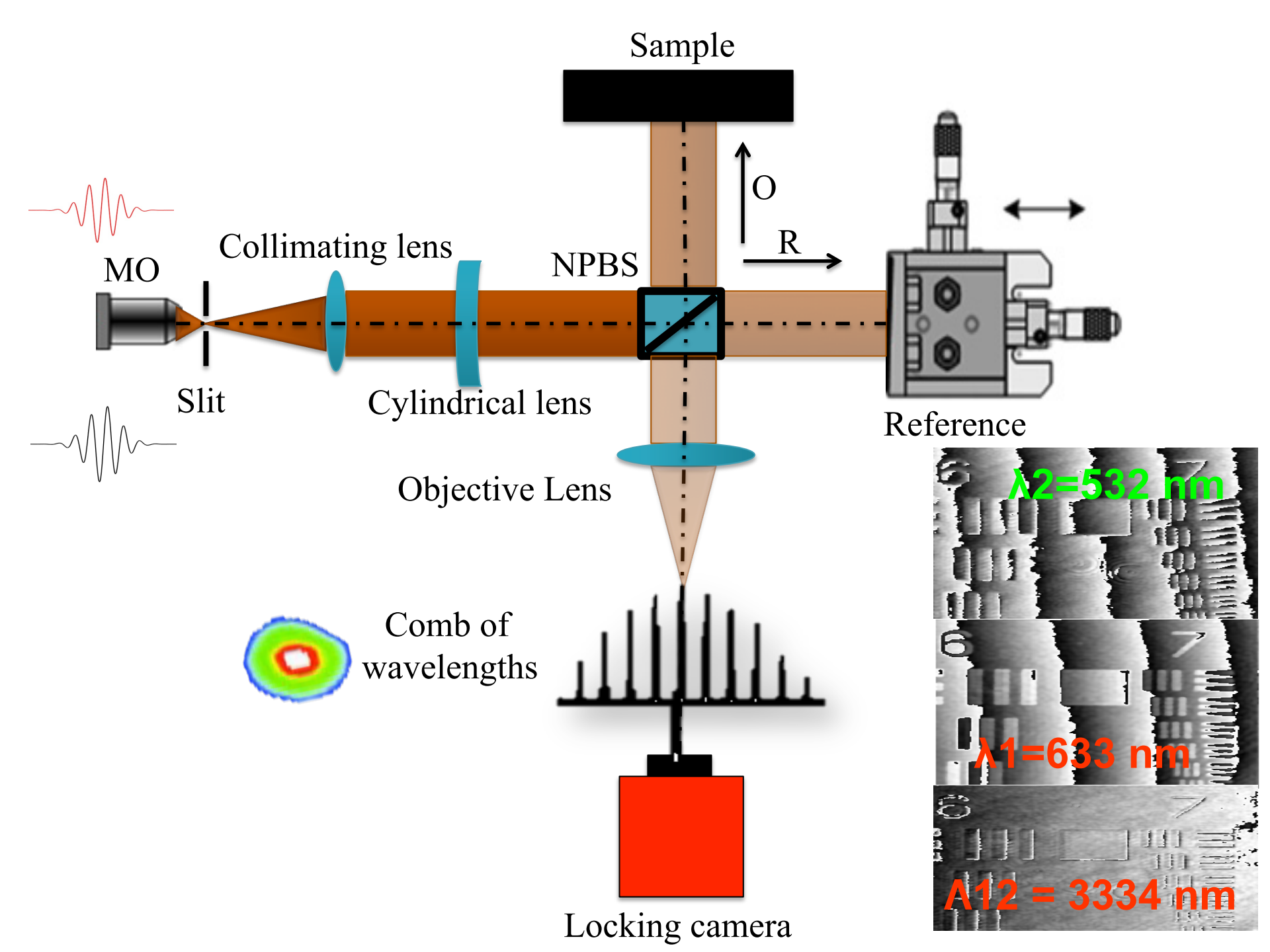
4- Multi-wavelength digital holography based on optical comb



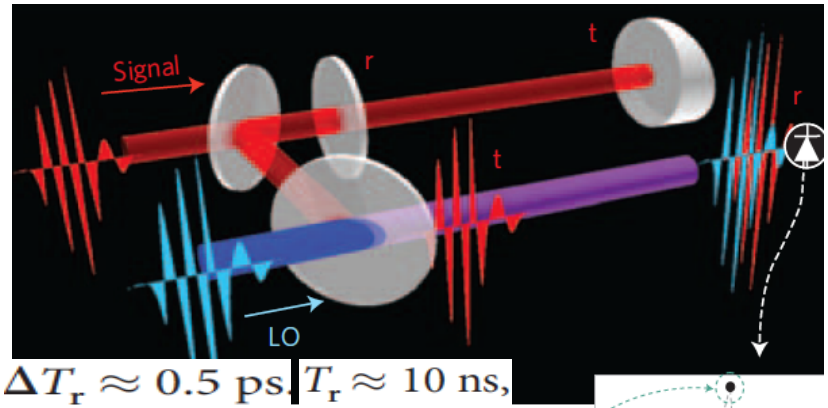




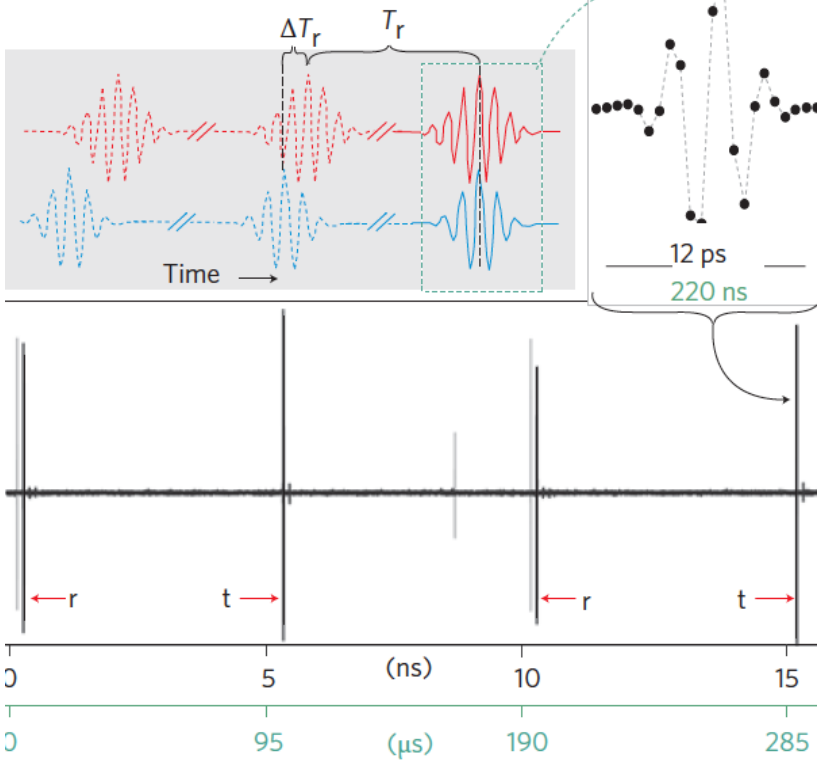


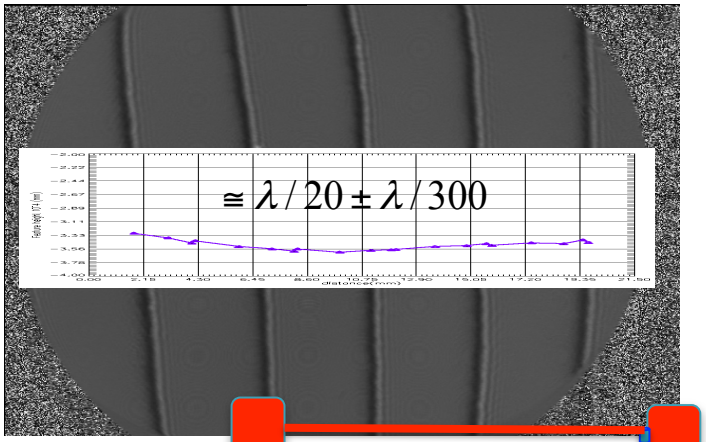

Sample
O
R
MO
Collimating lens
NPBS
Slit
Cylindrical lens
Reference
Objective Lens
Comb of
wavelengths
Locking camera
λ2=532 nm
λ1=633 nm
Λ12 = 3334 nm

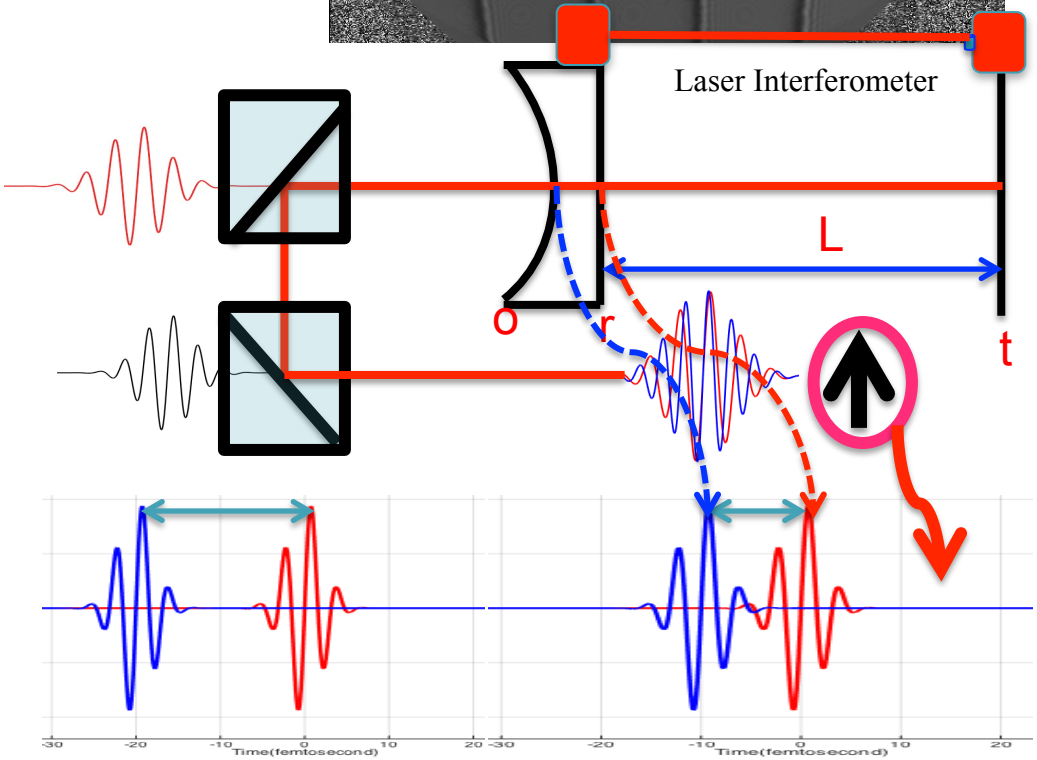
5- Strongly curved surface (or error in parallelism) measurement based on absolute distance measurement



$\Delta T_r \approx 0.5$ ps, $T_r \approx 10$ ns,







Thank you for listening.
Any questions or suggestions?