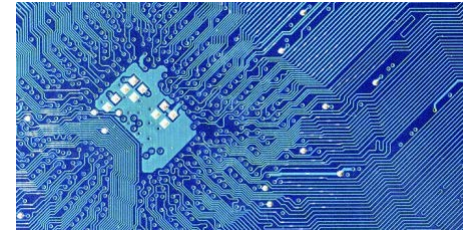


ULTRAFAST LASERS

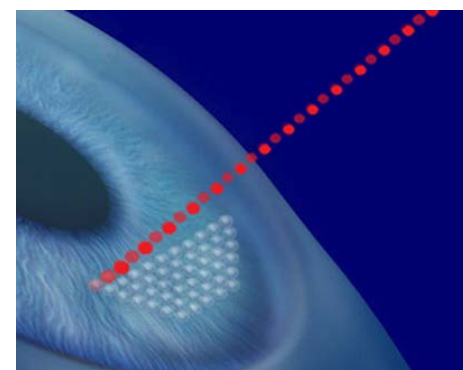
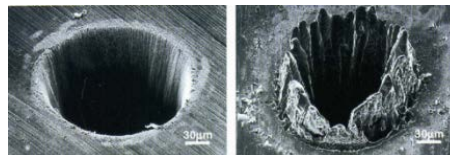
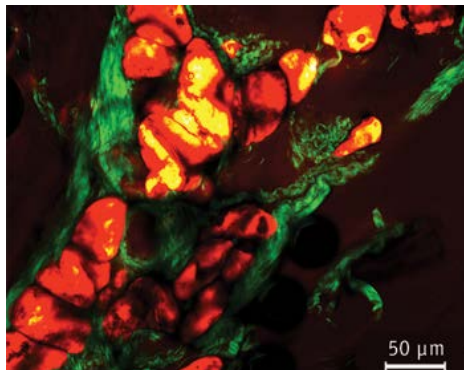
AVANCES EN I+D Y APLICACIONES INDUSTRIALES



“Procesos industriales en vidrio de láseres de femtosegundos”

ceit

SECPHO
Southern European Cluster
in Photonics and Optics



Our core business is to develop products and processes based on precision laser processes.

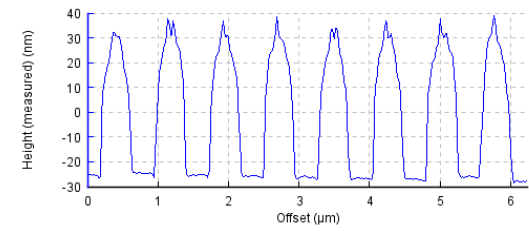
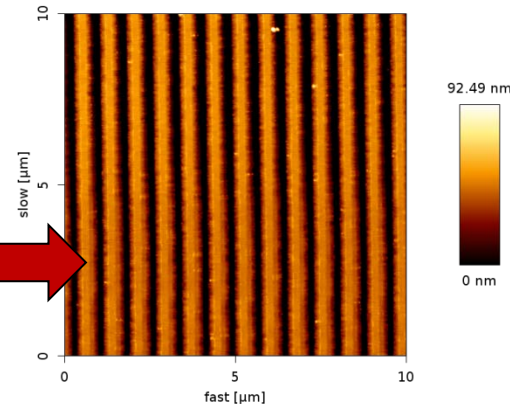
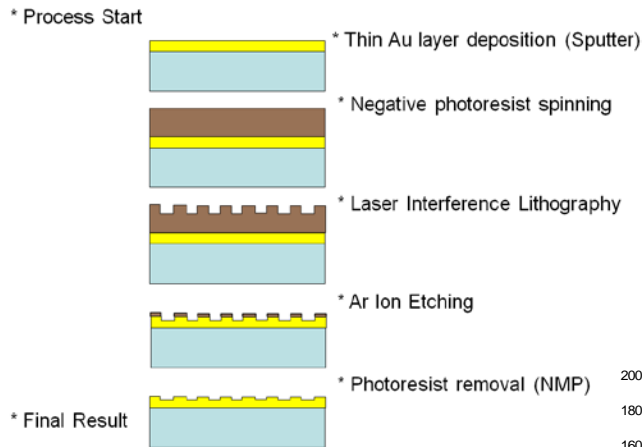
Our main activities include:

- Laser interference lithography: technology and applications
- Micromachining with femtosecond laser
- Properties of periodic nanostructure materials

Fabrication of metallic of gratings for SPP sensors

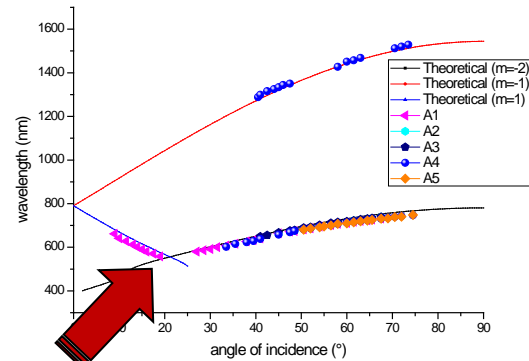
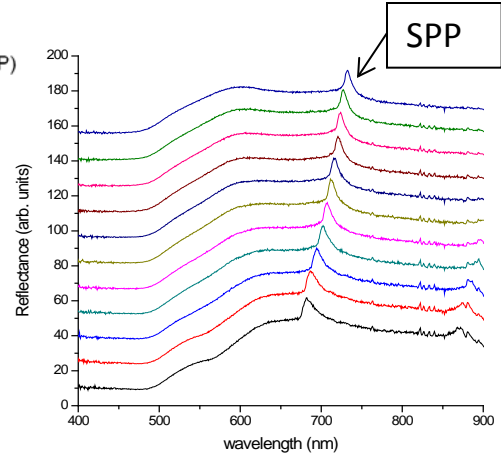
High quality, large area gold gratings are needed for surface plasmon coupling for (bio)chemical sensor applications

Fabrication process

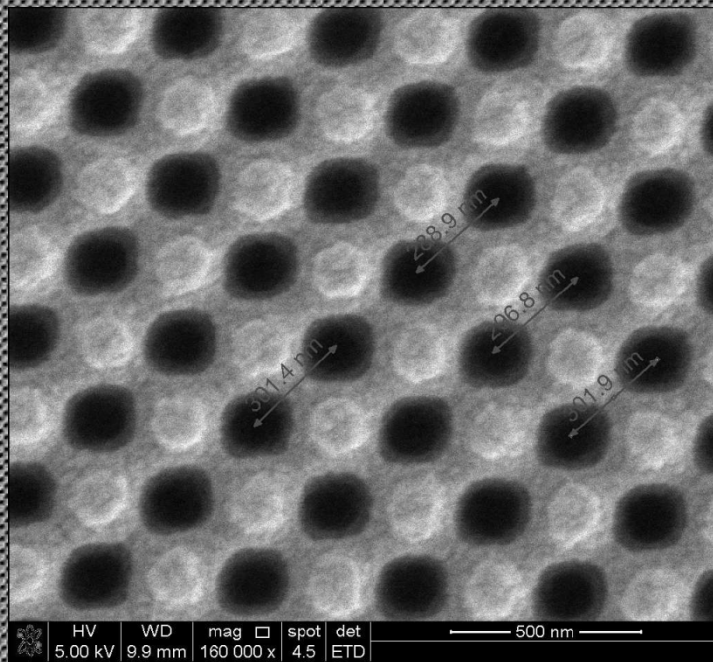


Good surface definition

Enhanced reflectance at specific wavelength in p-polarized light due to SPP coupling



Good agreement with theoretical models



HV
5.00 kV

WD
10.1 mm

mag
5 000 x

spot
4.5

det
ETD

20 μ m

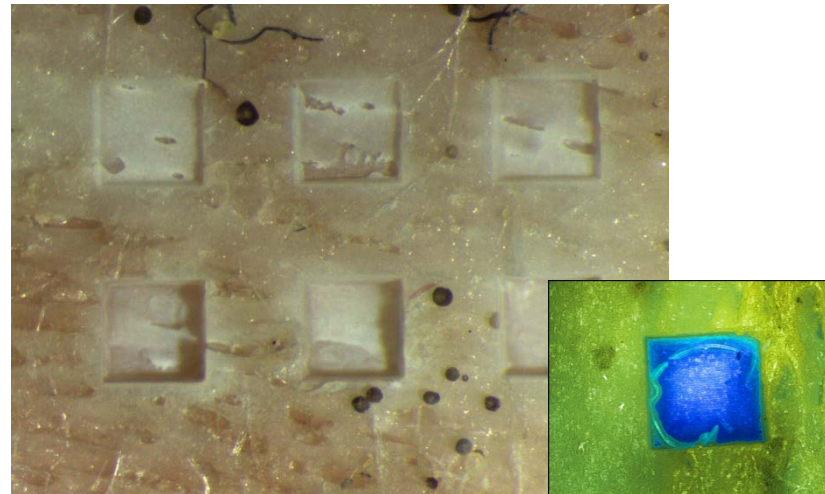
Precision micromachining of bone tissue with femtosecond lasers for medical applications

The micromachining of bone with picosecond lasers burns a layer of the tissue and produces a rough surface texture.



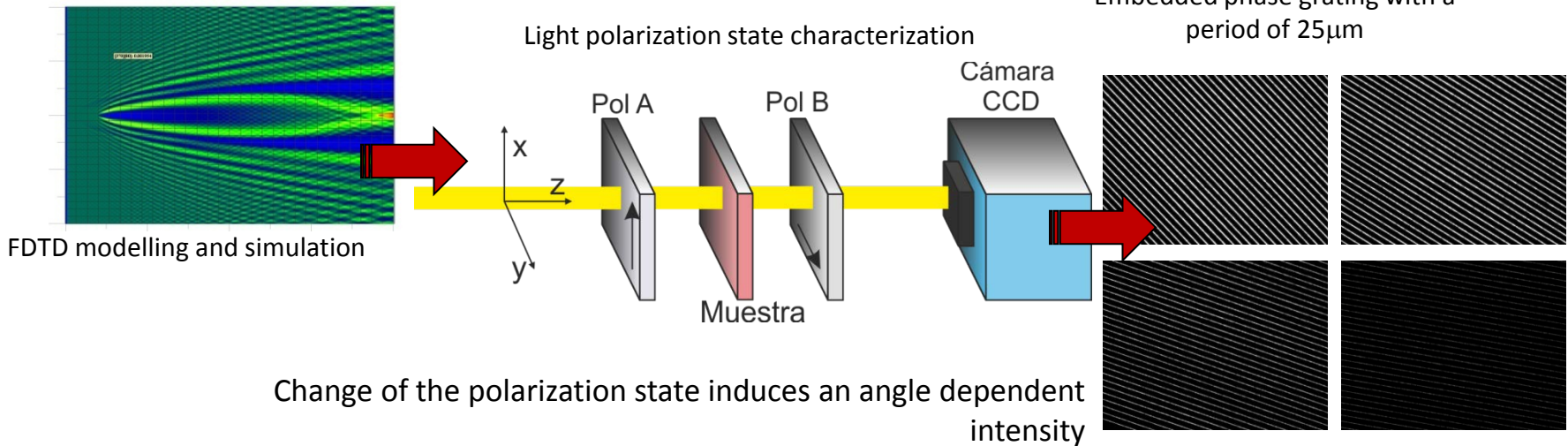
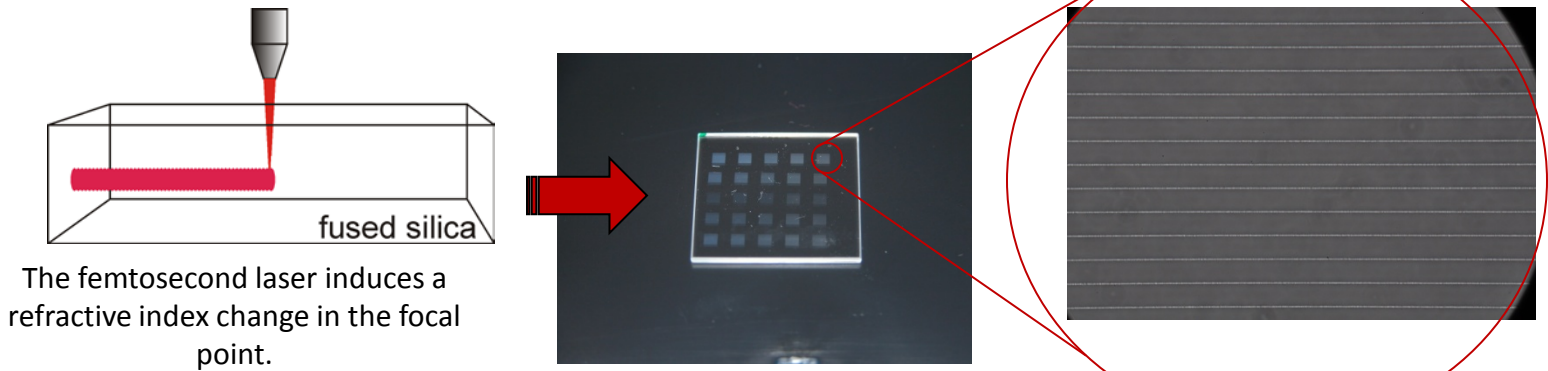
Picosecond
laser

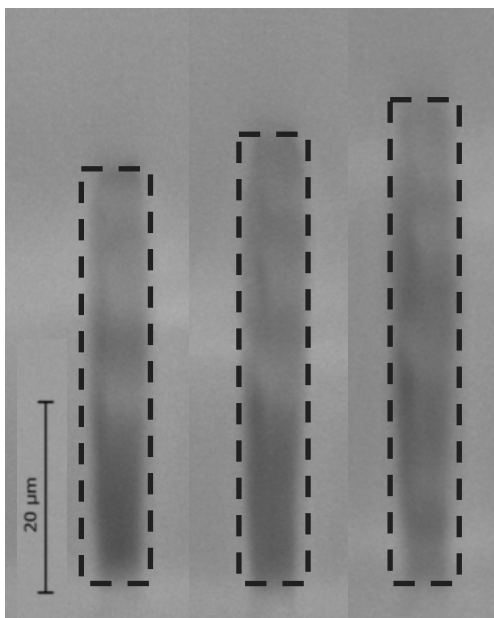
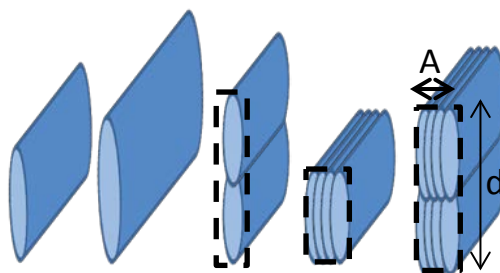
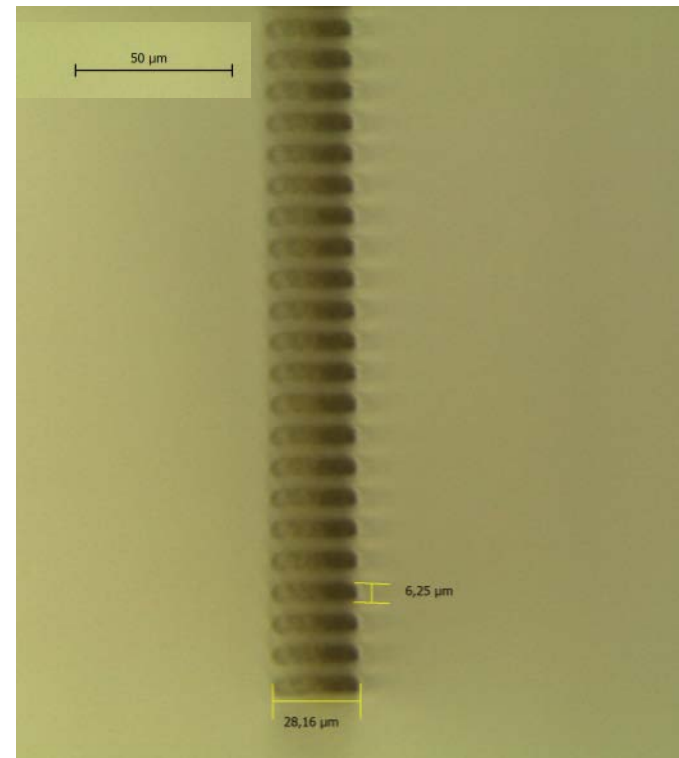
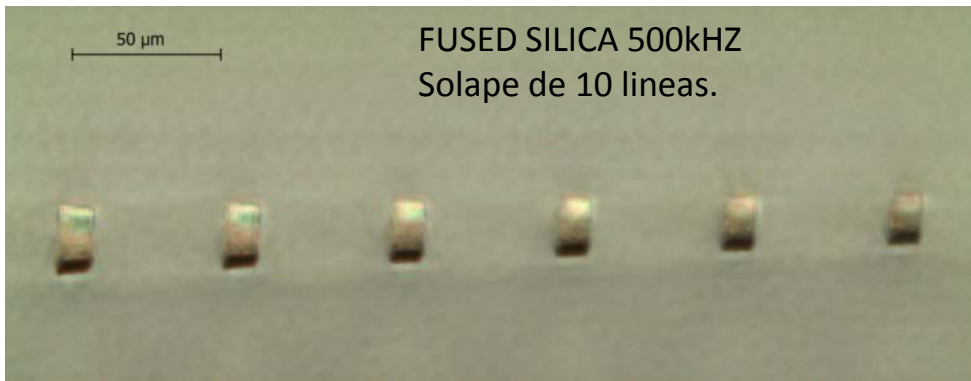
Femtosecond pulses produce highly precise and repeatable surface ideal for medical applications



Femtosecond
laser

Design and fabrication of phase and polarization gratings





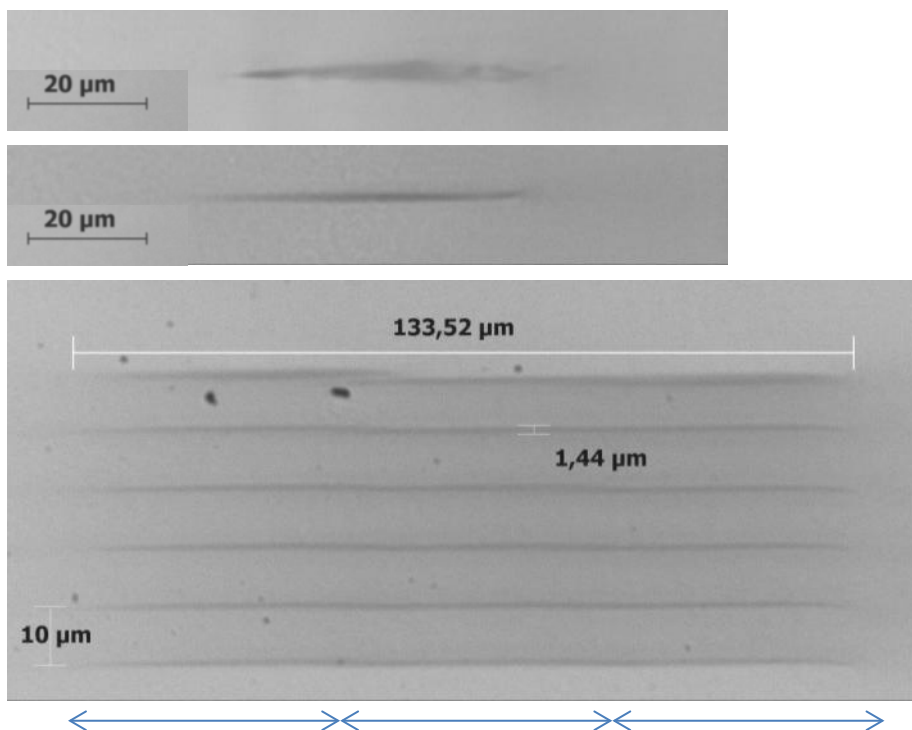
AF45
 1 kHz
 Solape de 5 lineas.
 1 capa -> $\Delta\phi$ (pendiente)

FUSED SILICA 500kHz
 Solape de 5 lineas.

1 capa -> $\Delta\phi = 0.29 \pi$ (medido)

2 capas -> $\Delta\phi > 0.5 \pi$ (extrapolado)

Divisores de Haz



+2 +1 0 -1 -2

$\theta = 4,2$

