Project idea/ Field of expertise: Optical fiber and analytic tools

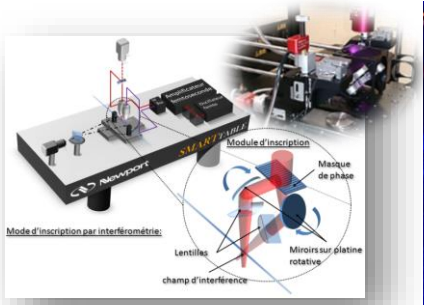
Organisation Name: CEA – Commissariat à l'Energie Atomique et aux Energies Alternatives

Addressed topic(s): HORIZON-CL4-2025-04-DIGITAL-EMERGING-01;

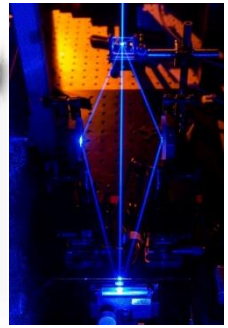
antonin.galtier@cea.fr

FemtoBragg– plateform for laser structuration of optical sensors

Nano- and femto-seconde laser structuration
Optcial fibers, Bragg network, Rayleigh, 3D Photonics printing



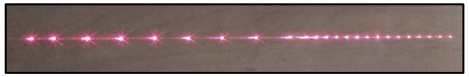
3 femto lasers test benchs
Direct writing on optical fiber



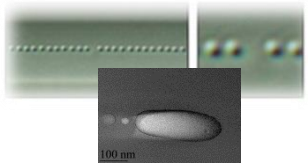
Laser KrF and
Interferometer from Talbot

3D printing at 2 photons
micro-components production

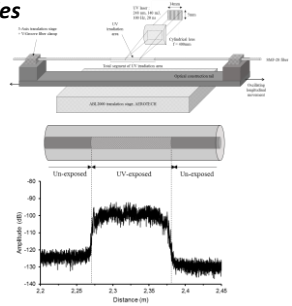
Sensors based on optical fibers
for Instrumentation in harsh environment



Groups of multiplexed femto DBRs
Based on micro-bubbles



Diffractive DBRs



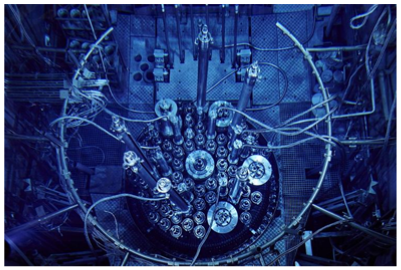
Rayleigh Amplification by laser isolation

- Structuration by doped silicium, silicium and sphir based optical fibers
- Test bench for 3D printing of micro-compoents in silicium
- Robust microstructures for harsh environments (high T° > 1000°C and RadHard)
- « Lab-in-Fiber » concept implementation: guided waves written by laser, Bragg networks,
- Groups of multiplexed femto DBRs, robust and accurate ; Rayleigh based sensors

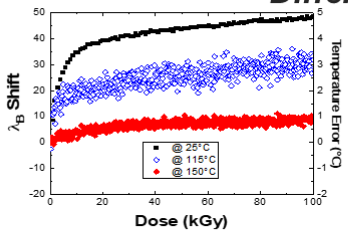
antonin.galtier@cea.fr

Examples of monitoring solutions in harsh environments

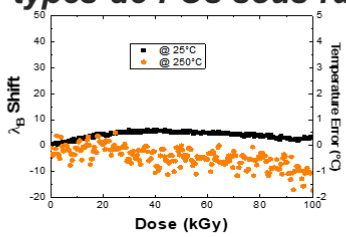
Sensors based on optical fibers for monitoring under radiation (TESCA, SCK/CEN) : design of robust optical fiber for measurements (T°, non intrusive pression, sodium leaks, …) or sensitive dosimetry



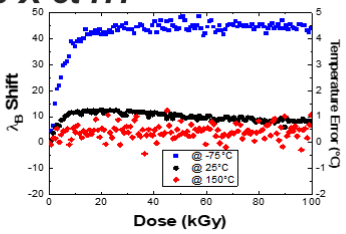
Différents types de FOs sous rayons X et HT°



Erreur inférieure à 1°C si T°$_{Irrad}$ > 150°C

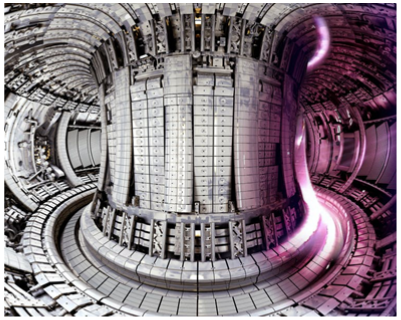


Erreur inférieure à 1°C
Recuit Thermique à HT° à prévoir

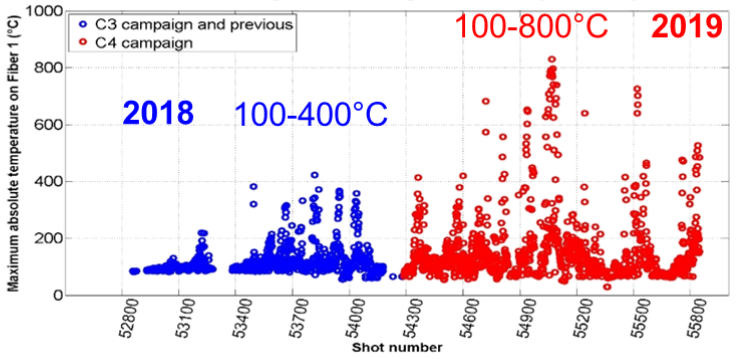


Erreur inférieure à 1°C si T°$_{Irrad}$ > 20°C

T°C monitoring in Tokamak : design of instrumentation for Divertor / high T° FBG measurements Diagnosis in control command room and IR thermography measurements.



1000°C @ sensing probe (4 mm)



Accessible with standard FBG system

antonin.galtier@cea.fr

Contact details

Contact person	
Organisation	CEA
Address	
Phone	+33 1 69 08 54 29
E-mail	antonin.galtier@cea.fr
B2Match profile	
LinkedIn/Twitter	