FEMTUM

Mid-IR industrial fiber lasers

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Co-founder & CEO

EPIC meeting - November 20, 2023

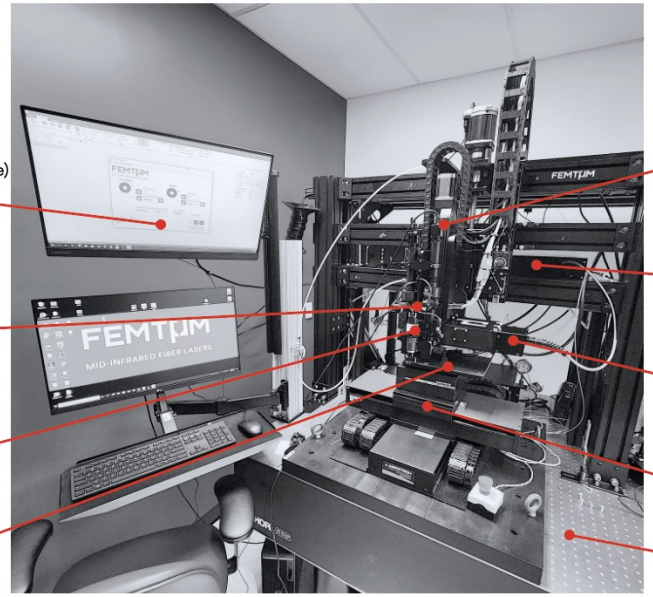
What we do?

We build the next generation of mid-IR lasers for science & industry

We assist our clients in their most demanding photonic applications

World's first short pulse (fs-ns) mid-IR fiber laser

In-house laser micro-processing station



Femtum control interface :
- Laser & fast shutter
- Vision and laser head positionning
- Scanner & positioning stages (DMC software)

Galvo scanner :
- Mid-IR Ftheta & objective lens
- Input apperture diameter up to 20 mm

Vision system:
- 20X & 4X top view cameras
- Side view camera

Test your samples here !

Corse (cm) to fine (µm) z-positionning

Femtum Nano 2800 fiber laser

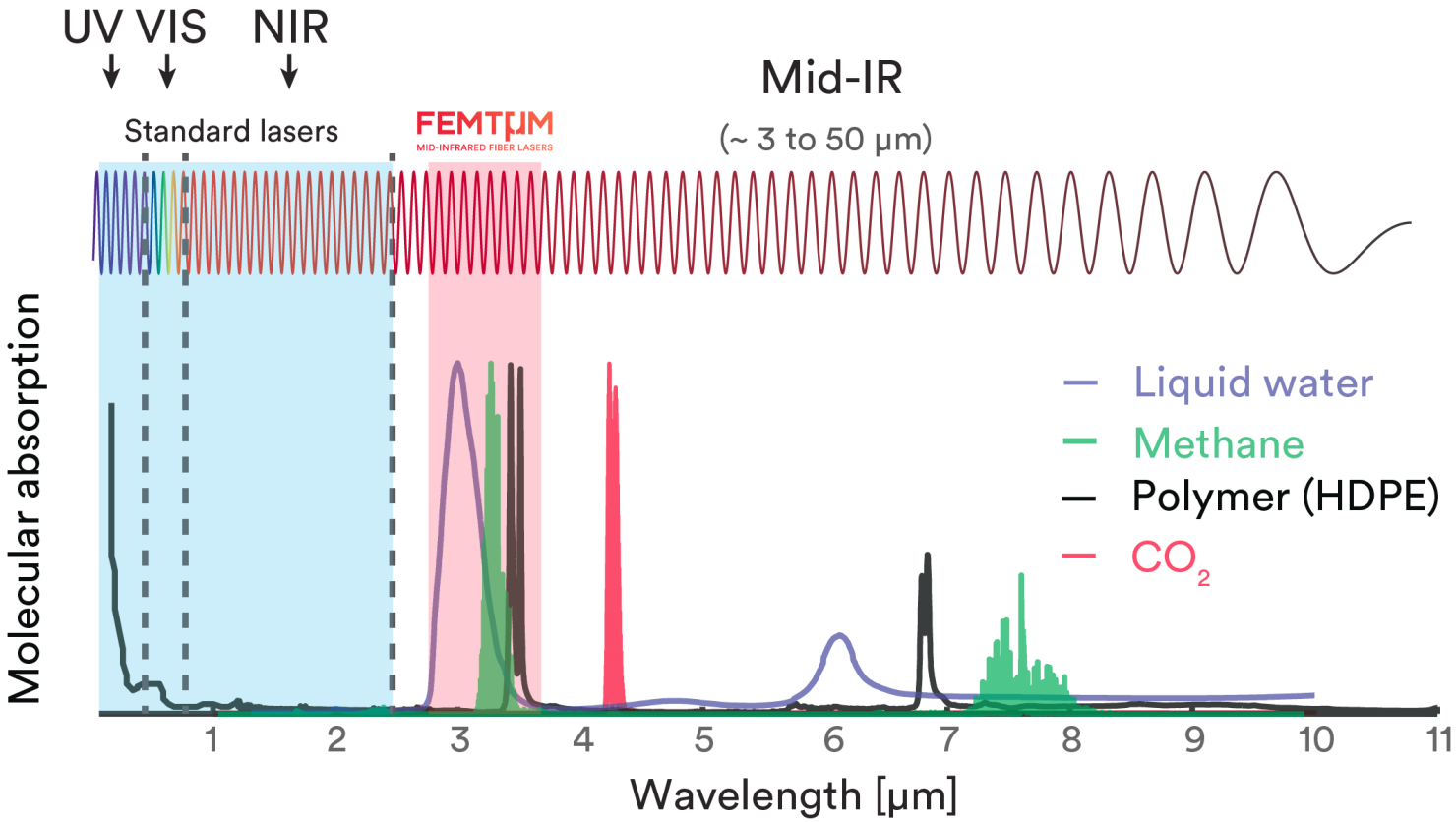
Output collimator:
- Beam expander
- Fast shutter / Pulse picker
- Variable attenuator

Aerotech positionning stages:
- Long travel range
- Fine accuracy
- High speed

Anti-vibration optical table

Why is the 3 µm range important?

Target strong molecular absorption bands



Scientific

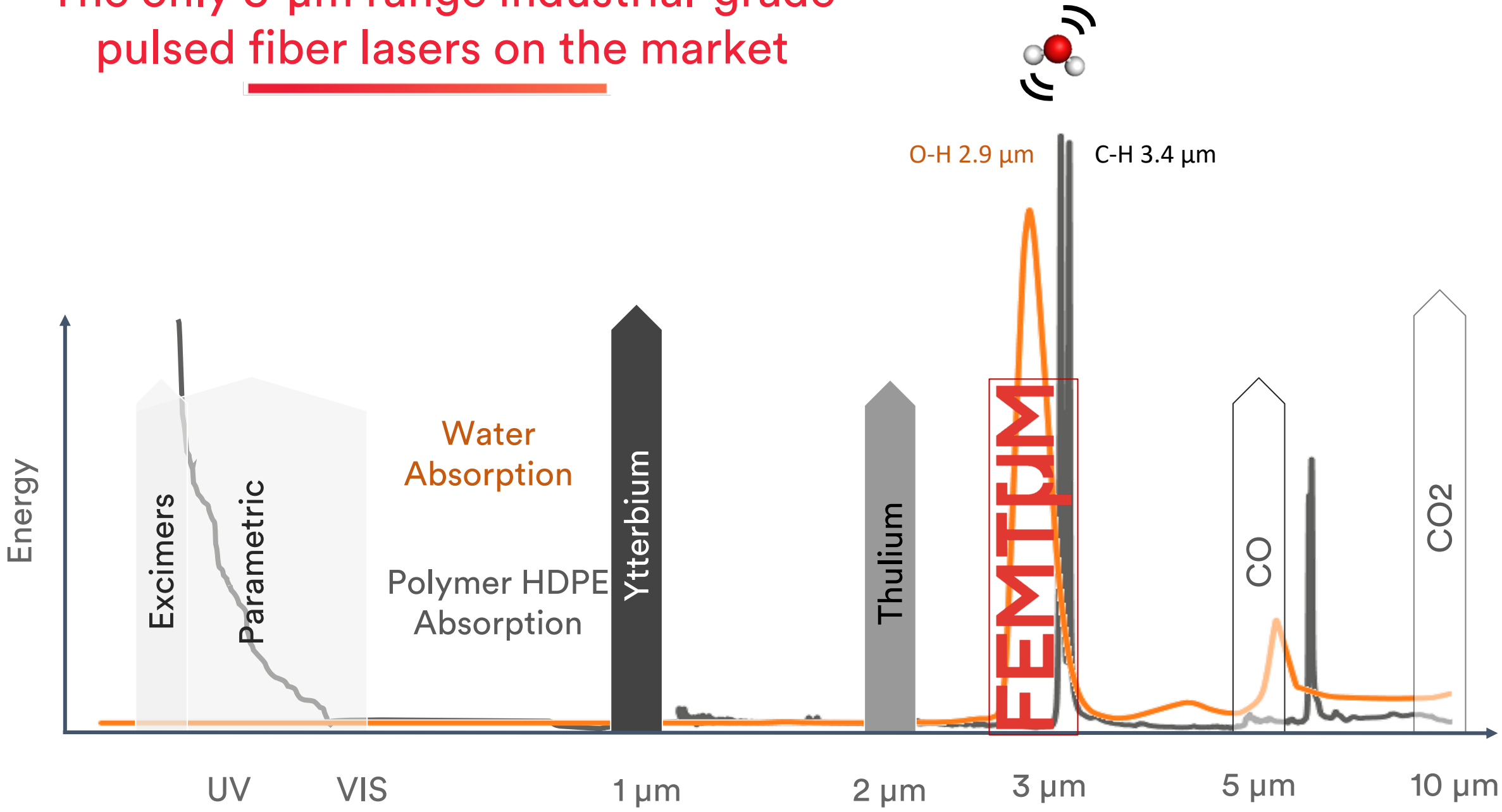
- Frequency combs
- IR spectrosocopy
- IR imaging

Industrial

- Polymer/organic material processing
- Selective processing
- Surgical procedures

FEMTµM

The only 3-µm range industrial-grade pulsed fiber lasers on the market



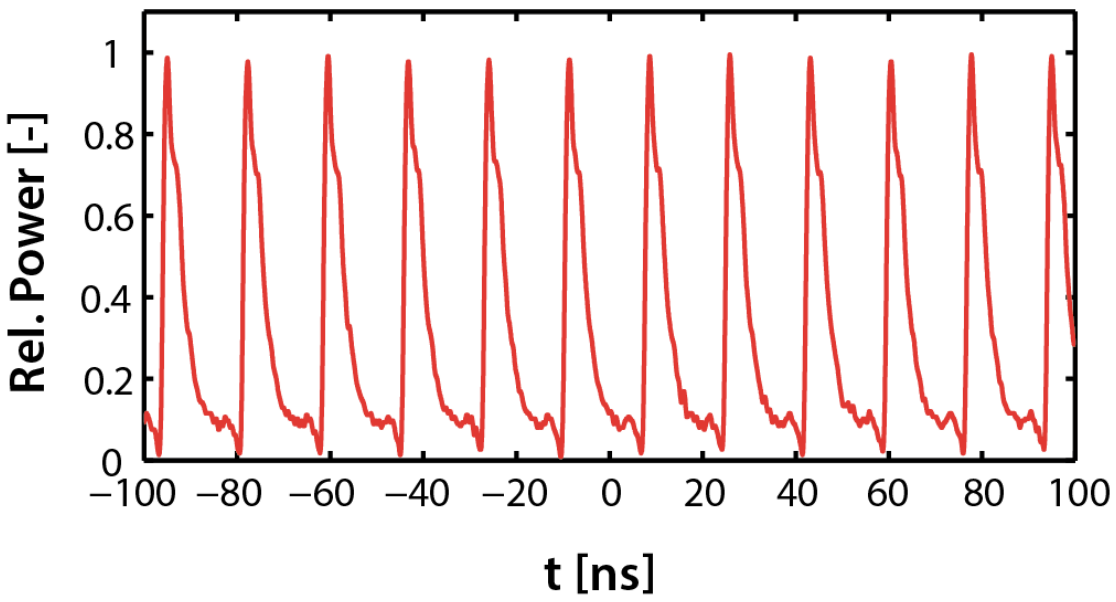
Femtum Ultratune 3400

Ultrafast tunable laser from 2800 to 3400 nm

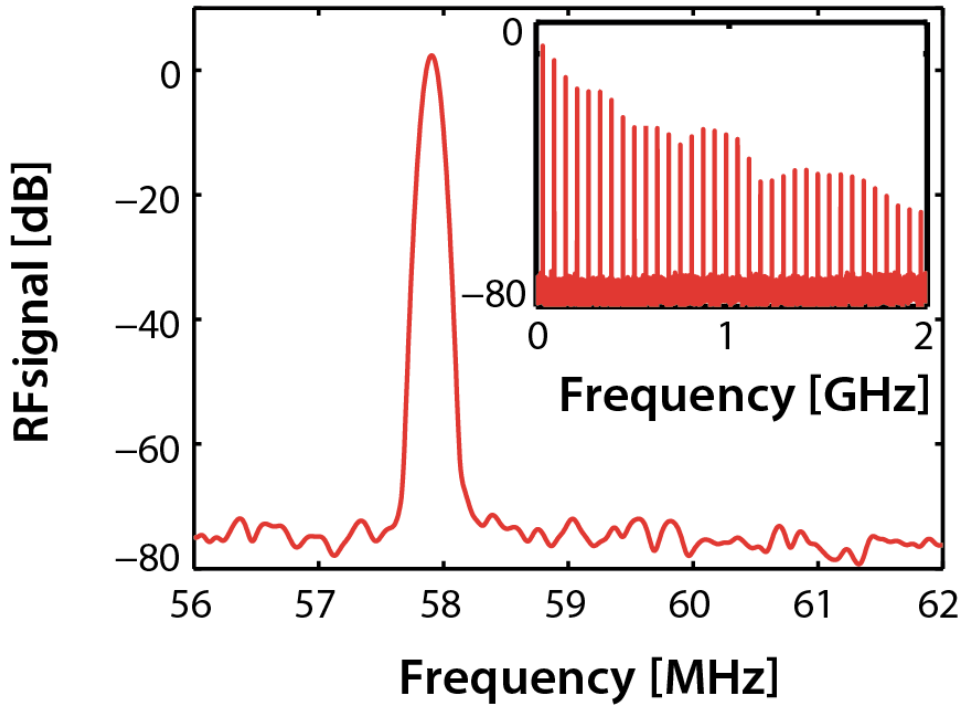
Temporal properties

- Pulse durations < 300 fs
- Repetition rate up to 50 MHz
- Pulse energy > 10 nJ
- Peak power > 200 kW
- Average power > 250 mW

Pulse train



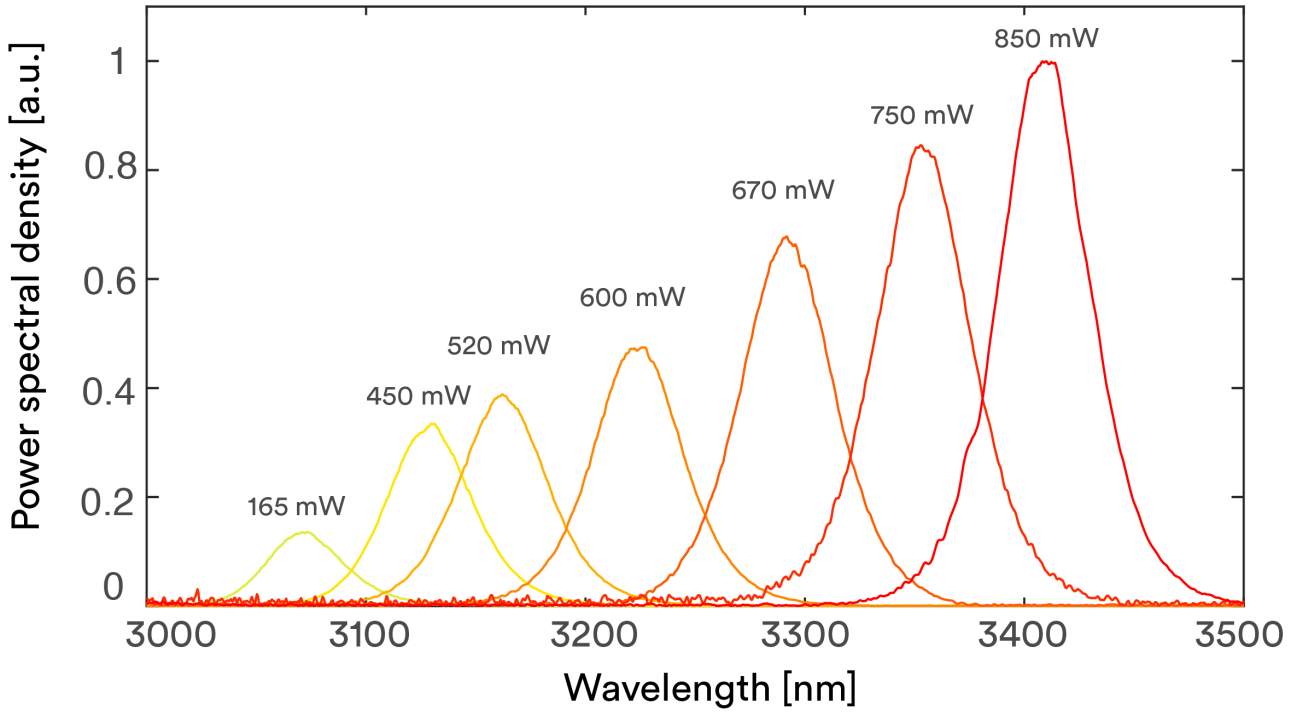
RF spectrum



Ultrafast tunable laser from 2800 to 3400 nm

Spectral properties

- Continuous tuning over > 400 nm
- Spectral bandwidth up to 50 nm
- Pure soliton spectral shape



Advanced spectroscopy applications

Nonlinear optics

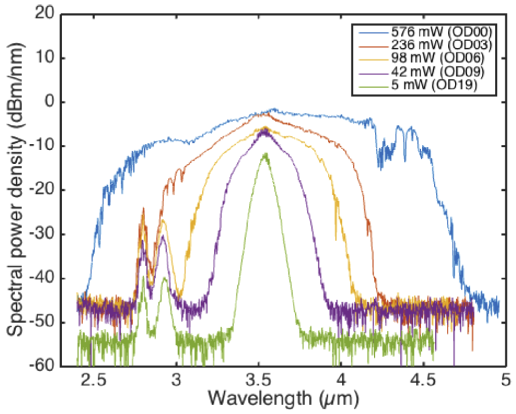


Figure adapted from : L.R. Robichaud et al., *Opt. Express* 28 (2020), p. 107-115

Semiconductor OCT

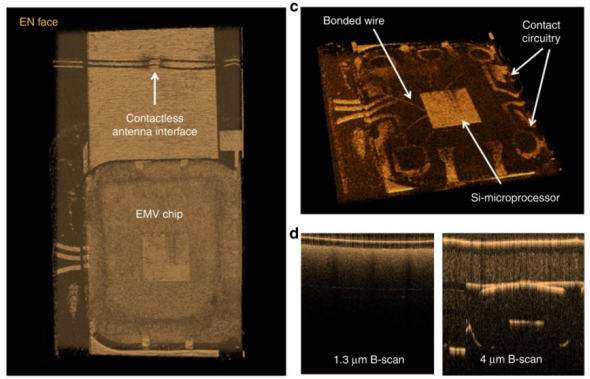
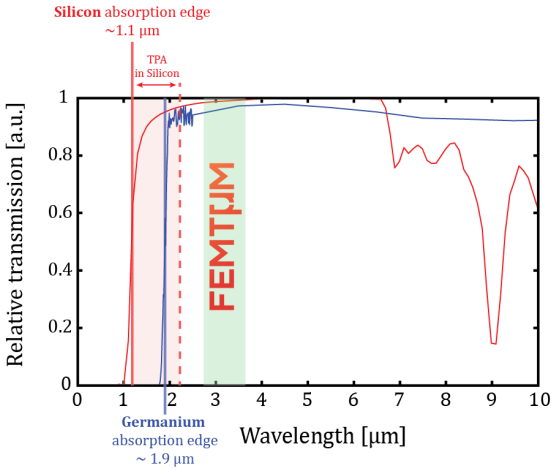
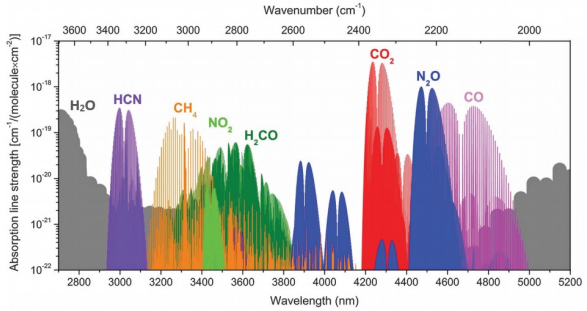


Figure adapted from : N. M. Israelsen et al., *Light: science & applications*, 2019, vol. 8, p. 1-13.

Silicon photonics



Spectroscopy



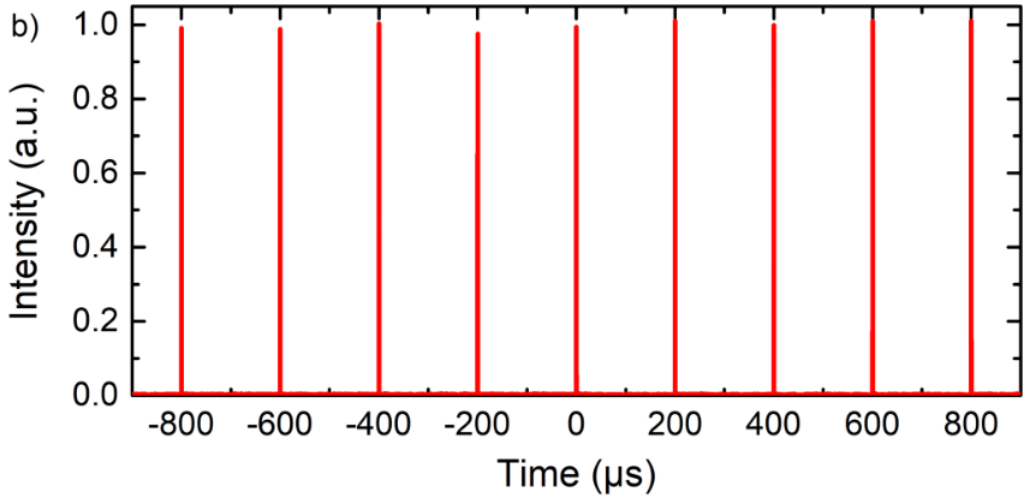
Femtum Nano 2800

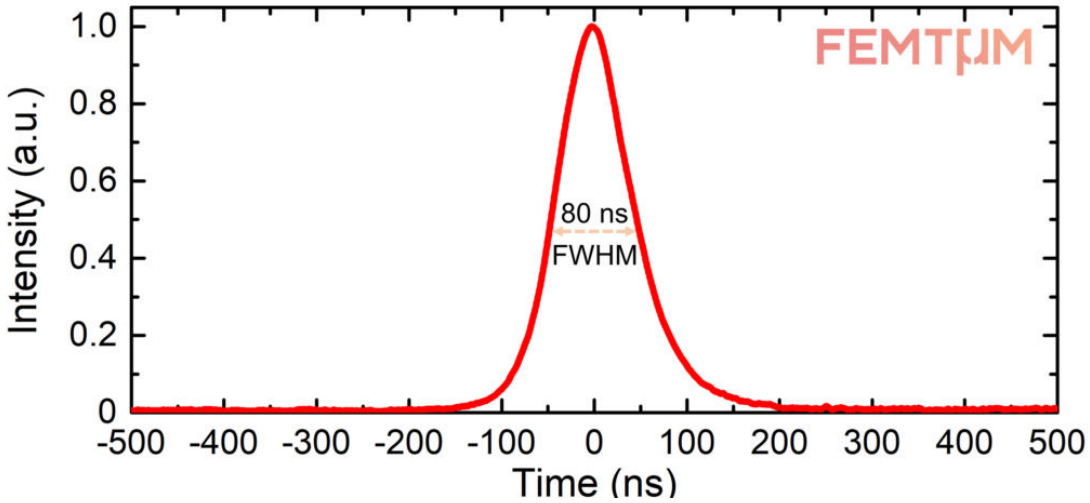
NANO 2800

Nanosecond fiber laser around 2.8 µm

Temporal properties

- Pulse durations : < 200 ns
- Repetition rate : up to 30 kHz
- Pulse energy : up to 100 uJ
- Average power : up to 3 W

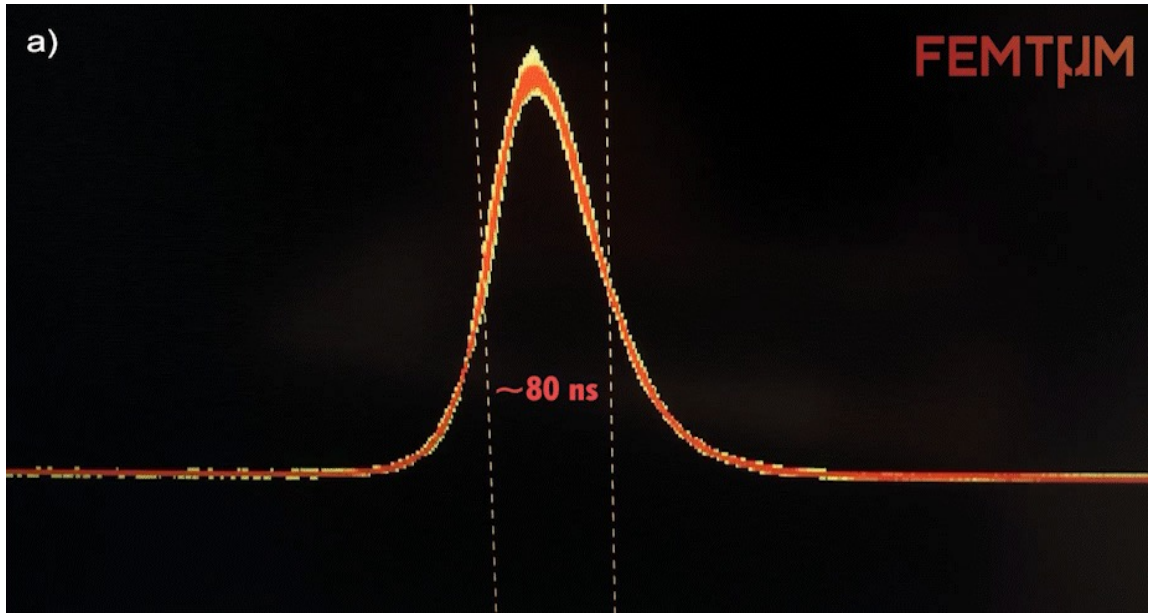




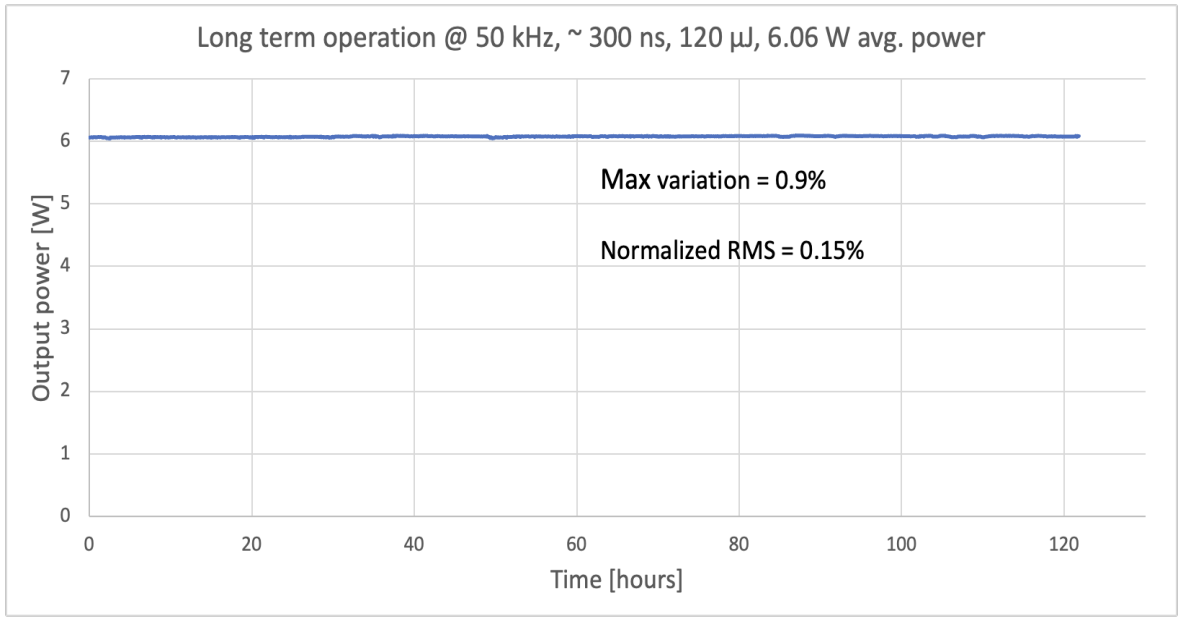
NANO 2800

Nanosecond fiber laser around 2.8 µm

Pulse-to-pulse stability



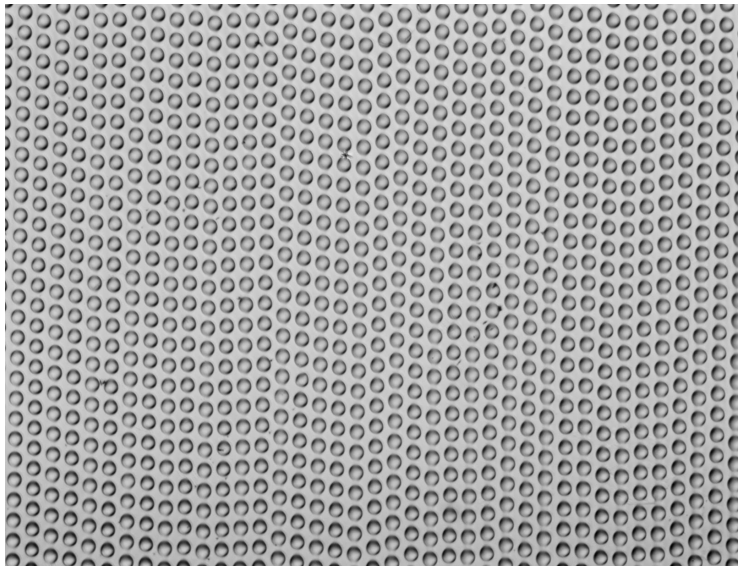
Long-term stability with 6W average power



Industrial applications

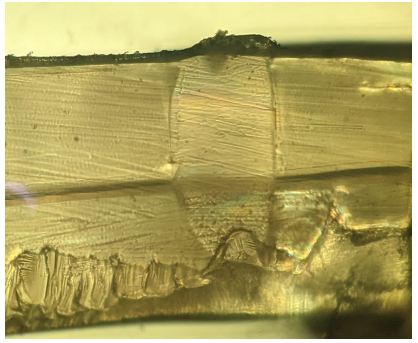
Micro-bump/texturation

Micro-lens on PC

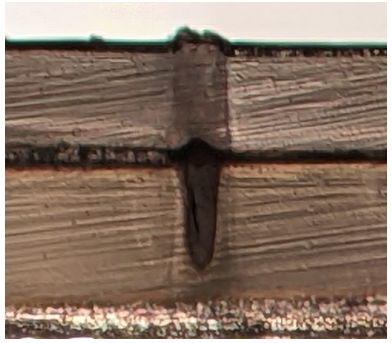


Welding

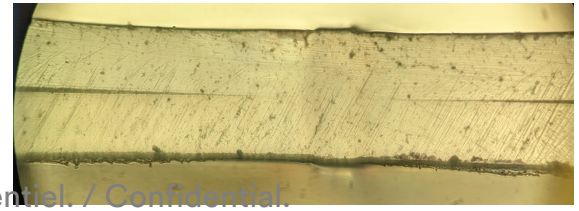
PET-PET welding
180-180 µm thick



PET-PC welding
180-125 µm thick

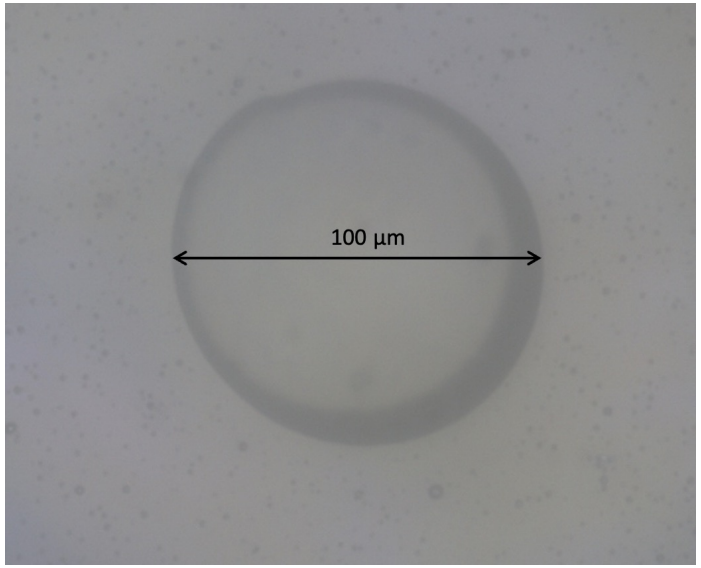


PC-PC welding
125-125 µm thick

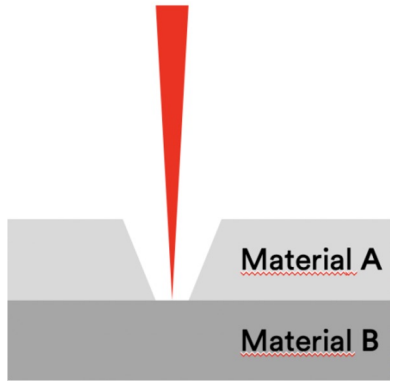


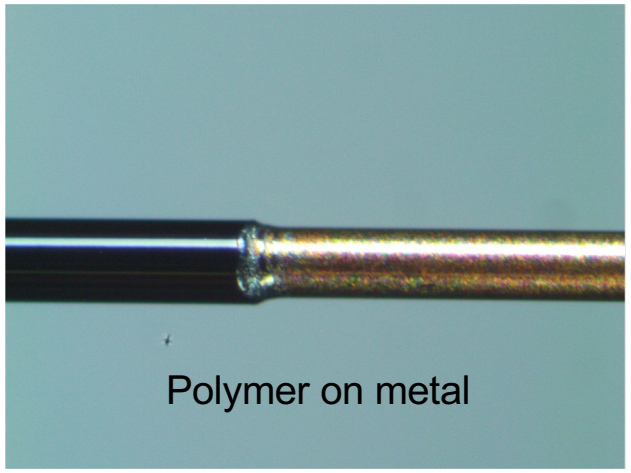
Ablation/drilling

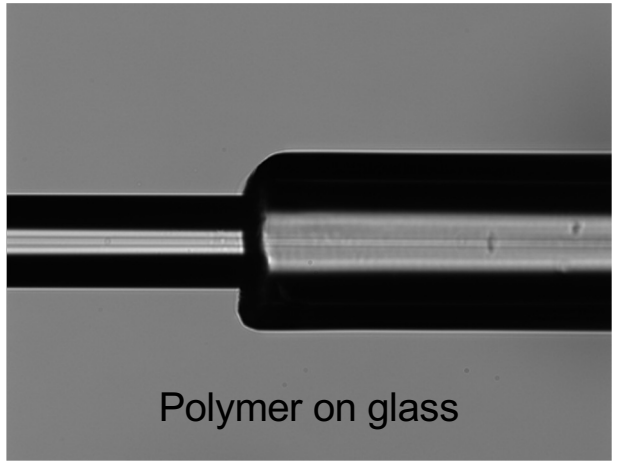
Epoxy-on-glass drilling
25 µm thickness

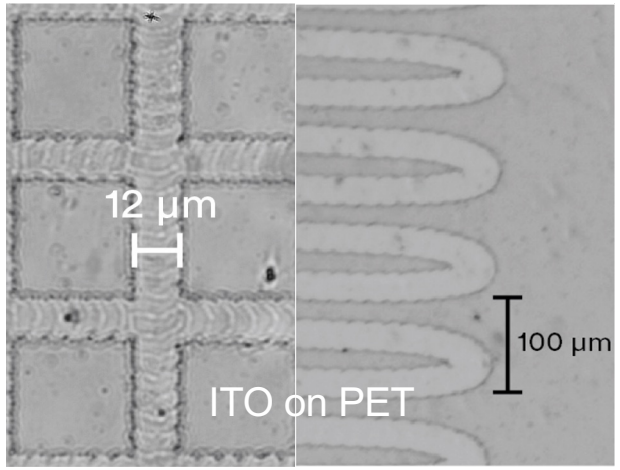


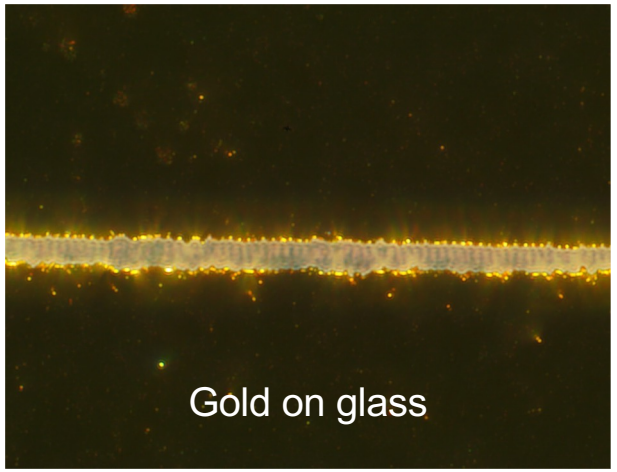
Industrial applications









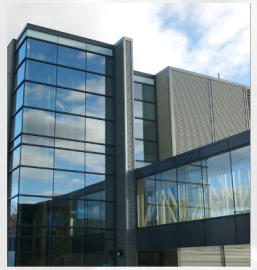


A CANADIAN START-UP SEEKING GROWTH

Québec Canada

A Canadian Spin-off of

COPL Centre d'optique, photonique et laser



World class labs

Production and R&D hosted at

quantino INO

Distributors

soliton PulsePower 脉动科技 Photonics Express Lasers & Optics for Industry & Innovation

BEAMS

Unique lasers

Patented laser technologies

Member of

EPIC European Photonics Industry Consortium

OPTICA Formerly OSA

OPTONIQUE

My objectives

1. Adopters
2. Solution partners
2. Suppliers

Contact details

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