MenloSystems

Precision in Photonics.
Together we shape light.

Frequency Combs

Terahertz Systems

Femtosecond Fiber lasers

1st European TERAFLAG Workshop, Cassis

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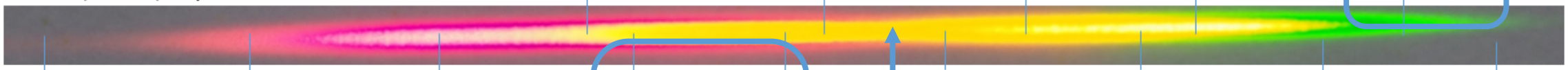
Dr. Milan Öri

Evolution through innovation.



Nobel Prize to Prof. T.W. Hänsch

2001
Spin-off, Max Planck Institute of Quantum Optics, T.W. Hänsch, A. Cable, R. Holzwarth, M. Mei

2002
First Product FC8003 Optical Frequency Comb
World Firsts

CEP Stabilization for few cycle lasers
World Firsts

2003
Femtosecond Fiber Lasers
fs lasers for science and industry
First fs fiber laser Made in Germany

2005
FC1500
Optical Frequency Comb based on fiber lasers
World Firsts

2007
Tera K8, Tera K15
Time domain Terahertz Spectrometers
First THz time domain spectrometer Made in Germany

2008
AstroComb for astronomy
World Firsts
ASOPS Systems

2009
TDS
Timing Distribution Solution
Joint project with MIT

2010
! World's first fiber-coupled TDS (1560 nm)

2011
ORS 1500
Ultra narrow linewidth laser with <1 Hz
For highest precision

2012
BlueCut
fs fiber laser with µJ pulse energy
For material processing and medical applications

2014
figure 9 ™ technology
Release of new series of fs fiber lasers and frequency comb systems based on proprietary mode locking technology
For industrial applications

2015
ELMO, ELMO 780
New fs fiber laser platform
For OEM customers

2016
FC1500-ULN Ultra Low Noise Comb
Allan deviation 10^{-16} in 1sec, 10^{-18} in 1000 sec.
For highest precision

2017
SmartComb
First Full Frequency Comb in 19'', 3U
TeraSmart
THz OEM Engine

2018
YLMO-930
fs laser for life sciences
for 2-P excitation of GFP
ORS-CUBIC
Ultrastable 1 Hz laser
for optical clocks and precision metrology

Terahertz Spectrometers: Compact, Versatile or High-speed

Compact

- All integrated system
- Flexible fiber-coupled THz path
- Robust and OEM-ready

Versatile

- Breadboard-based
- Dual wavelengths output
- Synchronization to external sources
- High-power laser

High-speed

- Breadboard-based
- Dual laser approach (ASOPS)
- No moving parts
- Ultra fast, ultra narrow (MHz)

R&D Projects | New Applications

Thickness detection

- NDT on multilayered paint for application in automotive industry
- Aim: fully automated, calibrated and rapid control of thickness
- Collaboration: Fraunhofer ITWM, das nano

Seed grading

- Online monitoring for seed grading
- Spectroscopic information used to implement separation algorithm
- Collaboration: Philipps Universität Marburg, TEM Messtechnik

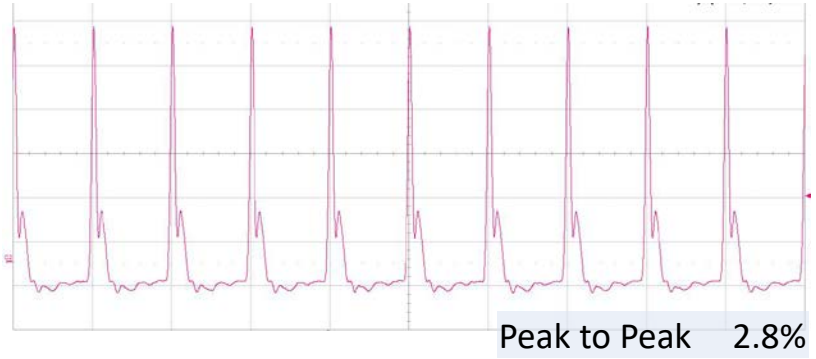
OEM-Integration | Fiber lasers and THz engines

Er-based figure 9® lasers

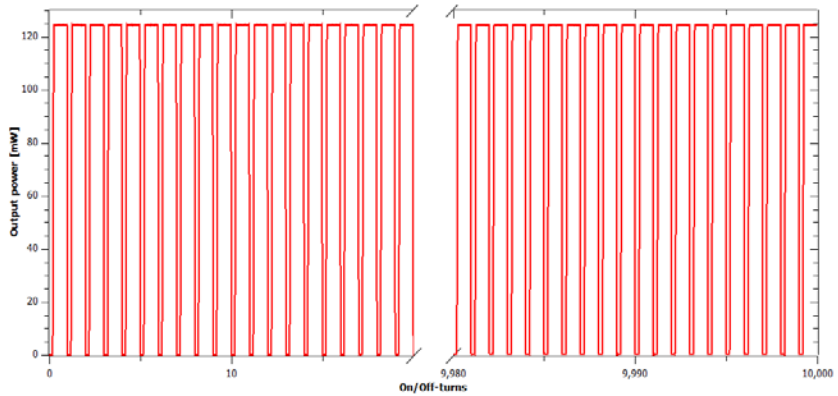
- **Patented technology**
- Rock-solid technology for next generation stability and reliability
- No moving parts, no saturable absorber, all PM-fiber

Custom solutions

- In-house production with high degree of modularity
- Flexible laser configuration
  - SHG, Multi-branch
- Dual-Channel spectrometers
- DFG-THz systems (e.g. Far-IR optical excitation)
- Synchronization to external sources



1560 nm output signal of 100 MHz laser system



Reproducibility: Identical and consistent laser performance

* Hänsel et al., All polarization-maintaining fiber laser architecture for robust femtosecond pulse generation, Appl. Phys. B, 123:41, 2017.

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What’s your crazy idea?