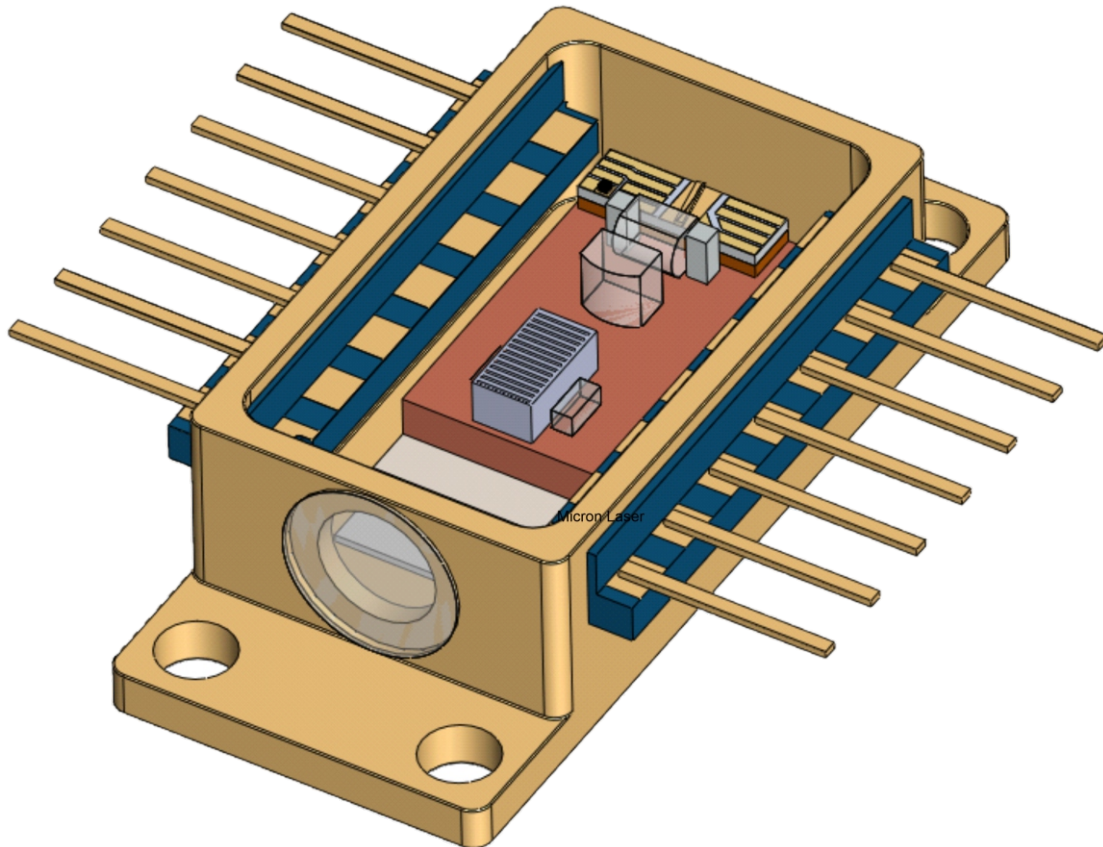


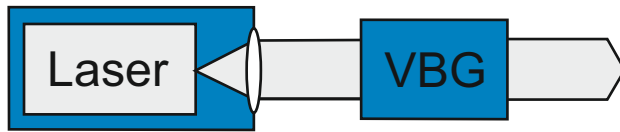
Micron Laser

Tunable External Cavity Diode Laser
kHz and sub-kHz Linewidth

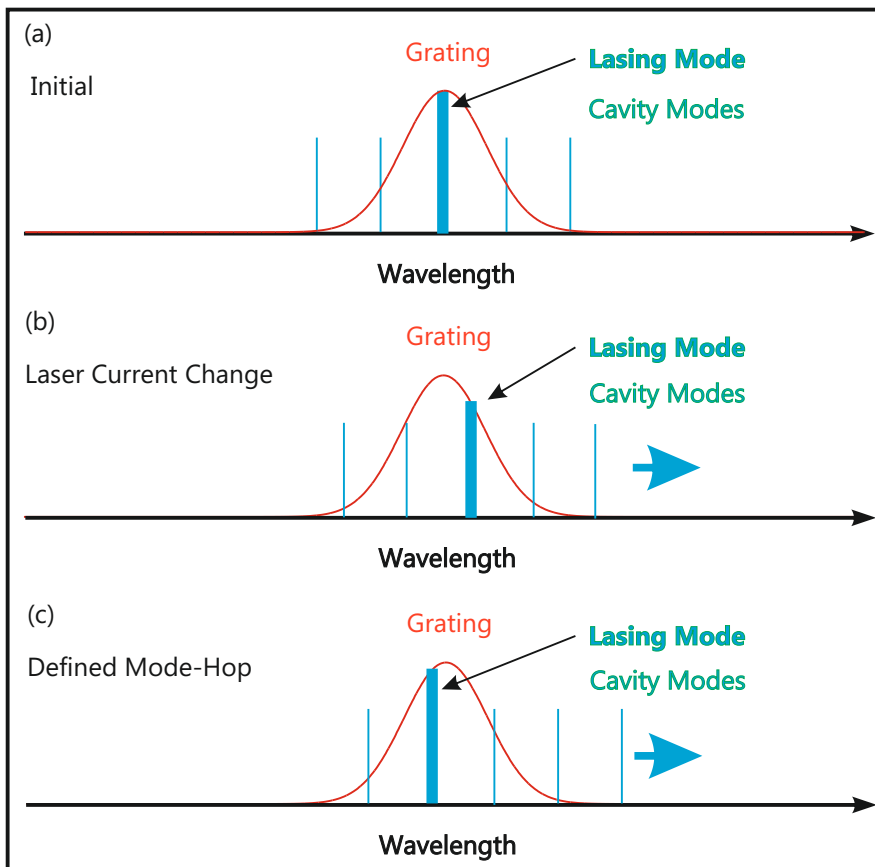
Scientific Lasers



Once you tested,
You will never use a Littrow ECDL again



Laser Cavity Modes



Monolithic Laser Design

The classic Littrow Laser design suffers by its sensitivity on acoustic disturbances and thermal drifts. Using a monolithic cavity design based on AI assisted micro-assembly technology with a VBG as reflector is a real game changer in laser technology [1, 2]. This key-step innovation results into a highly stable cavity with kHz and sub-kHz intrinsic linewidth and a minor package size.

Tuning Behavior

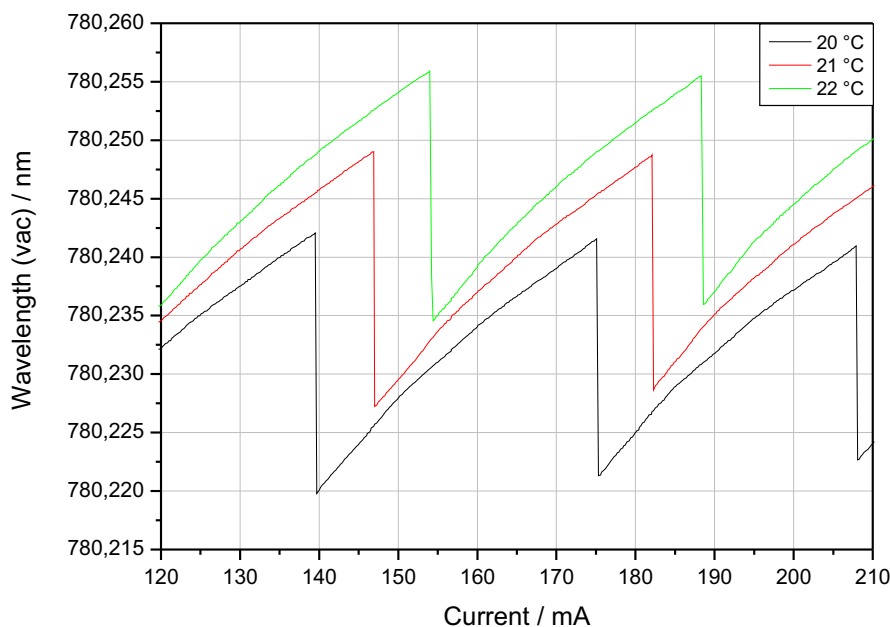
The laser current tunes and stabilizes VBG lasers in a very reproducible way. When changing the laser current, the cavity mode shifts due to the effect of the laser current on the refractive index of the gain chip (b). When an active mode moves out of the reflectance spectrum of the VBG, there is the next mode ready to take over lasing within the target range (c). No more undefined mode-hopping. We published this innovative design of the **Micron** Laser already in 2015 [1, 2].

AI Assisted Assembly

Sacher Lasertechnik developed an AI assisted assembly robot which manufactures the **Micron**. Its performance is documented inside of the assembly robot. Please ask us for our assembly video showing the process. No more quality issues due to human issues.

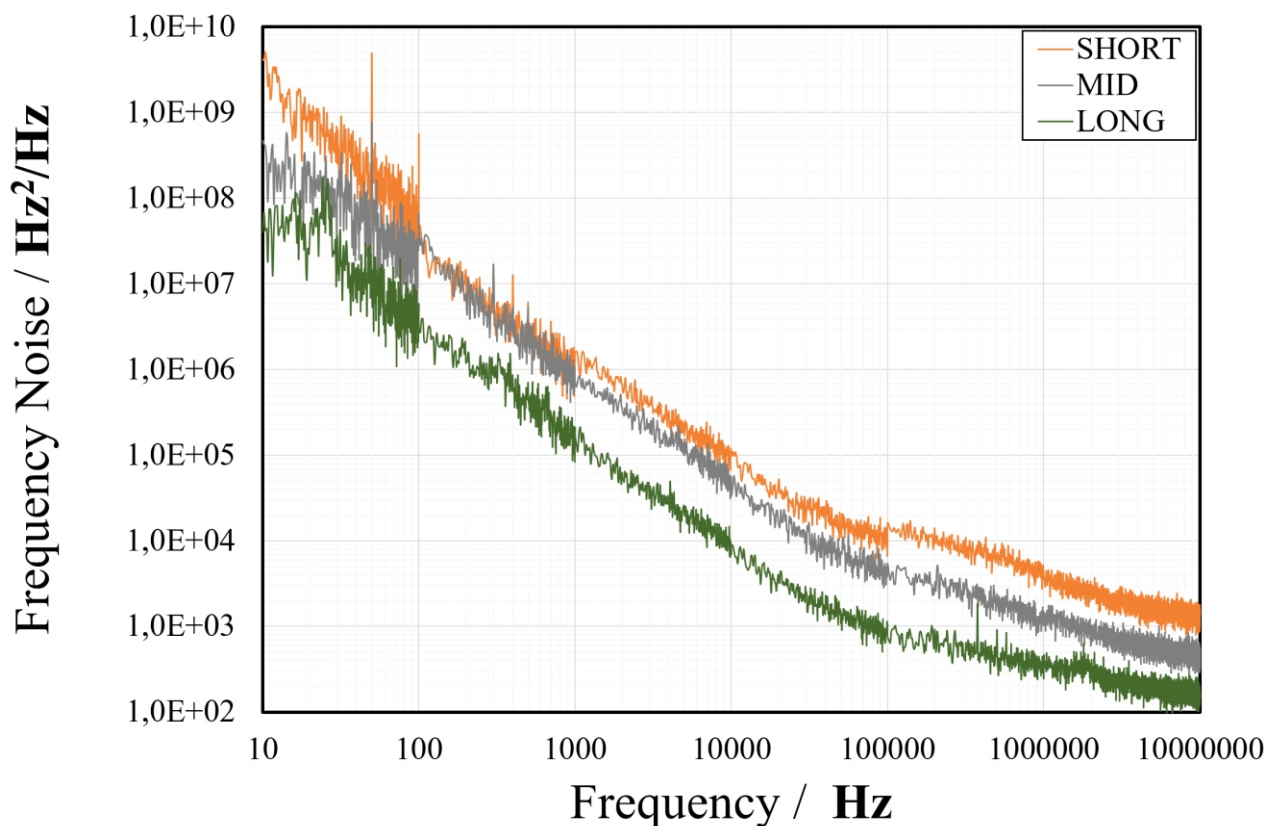
Literature

- [1] S. Rauch and J. Sacher, <https://doi.org/10.1109/LPT.2015.2438545> (2015)
- [2] A. Jimenez et al. <https://doi.org/10.1117/12.2255635> (2017)

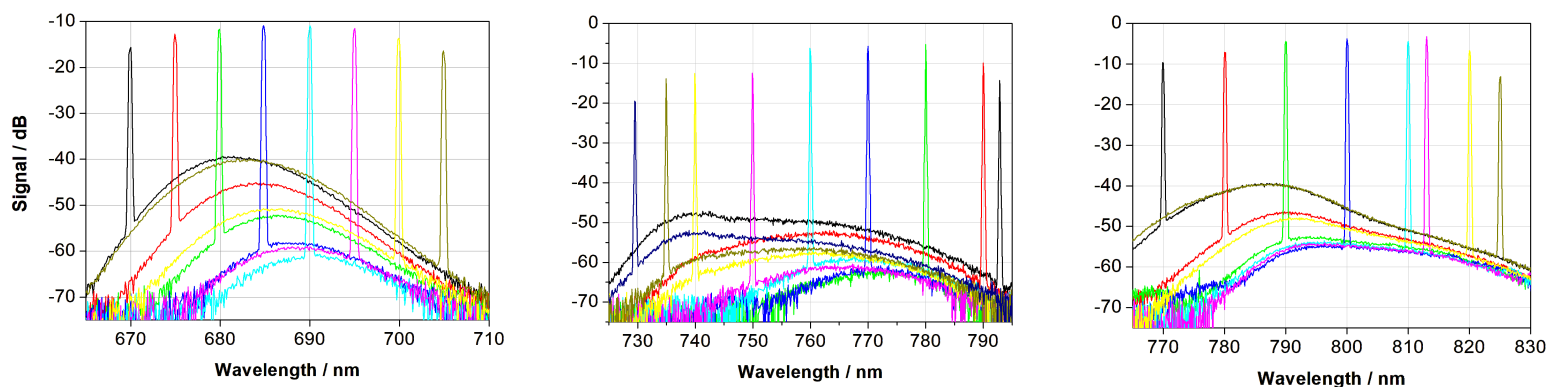


Key Features of our Micron Laser

sub-kHz Linewidth



Available Wavelength (3 Examples out of 30+ Wafers)



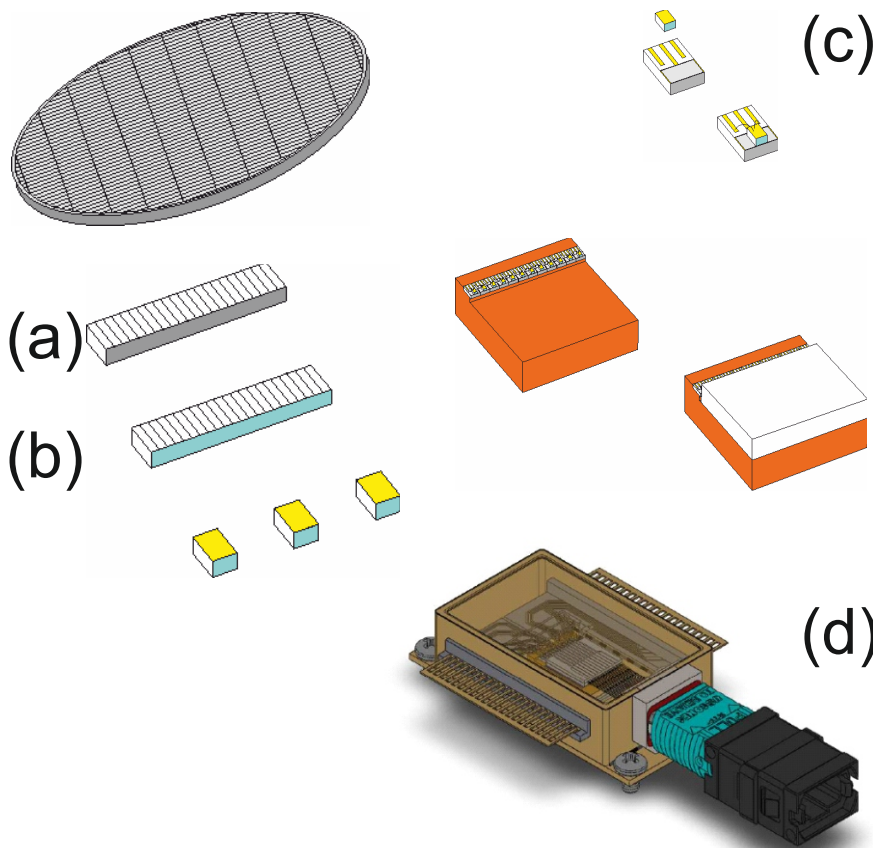
Specification: Summary

Output Power	10 .. 150 mW (depending on wavelength)
Wavelength	635, 671, 674, 678, 689, 698, 707, 729, 760, 770, 780 785, 795, 811, 852, 895, 1064, 1550, 2050 nm, or customized
Wavelength Tuning	6 .. 15 GHz (depending on wavelength and model)
Linewidth	3 kHz ... 0.5 kHz (instantaneously)
Side Mode Supression	> 50 dB
Fiber Delivery	Pigtaled with single stage optical isolator and FC/APC

specifications are subject to change without further notice

Key Technology of our Micron Laser

Laser Chip Technology



In-House Chip Assembly

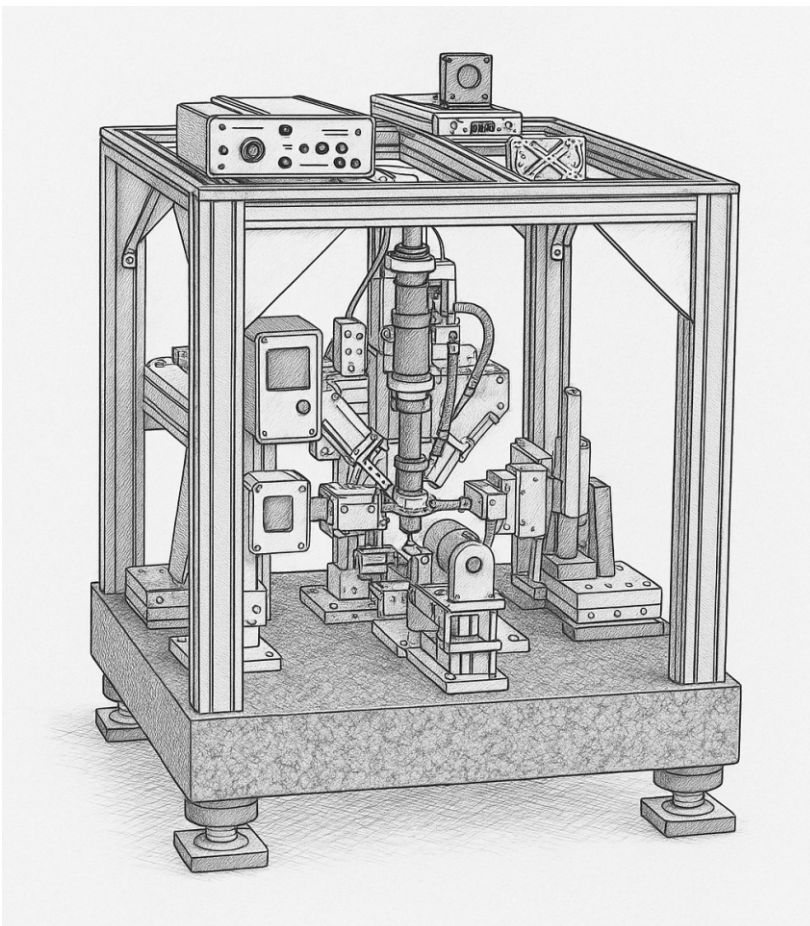
Key element for highly stable lasers is an in-house chip technology. Most of our gain chips base on our own chip design. We receive our lasers as laser wafers and we own the technology for all subsequent in-house processing.

We perform:

- (a) Scribing and Cleaving
- (b) Laser Facet Coating
AR & HR Coatings
US Patent No. 6,297,066
US Patent No. 6,869,483
- (c) Bonding and Soldering
- (d) Integration into Sealed Integrated Assemblies

With this in-house technology, we are no longer restricted by typical form factors which are restricting miniaturization.

AI Assisted Assembly Technology



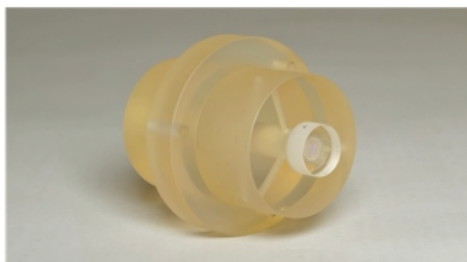
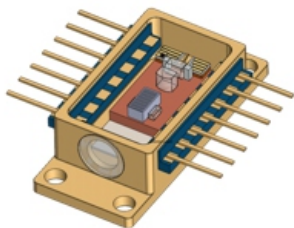
Assembly Robot

Key point of performance and stability of our **Micron Laser** is the automated assembly of the full laser via an AI assisted assembly robot. The robot identifies each component, places it at the desired position with high precision. Once the initial positioning is done, the laser is operated and the exact positioning is recognized on a sub-micron scale with an AI algorithm. Once the laser system reaches its state each element will get fixed in exactly the position where it is supposed to be. All specs are verified and recorded automatically by our process algorithm. By this way, we ensure highest quality and reproducibility due to our process technology.

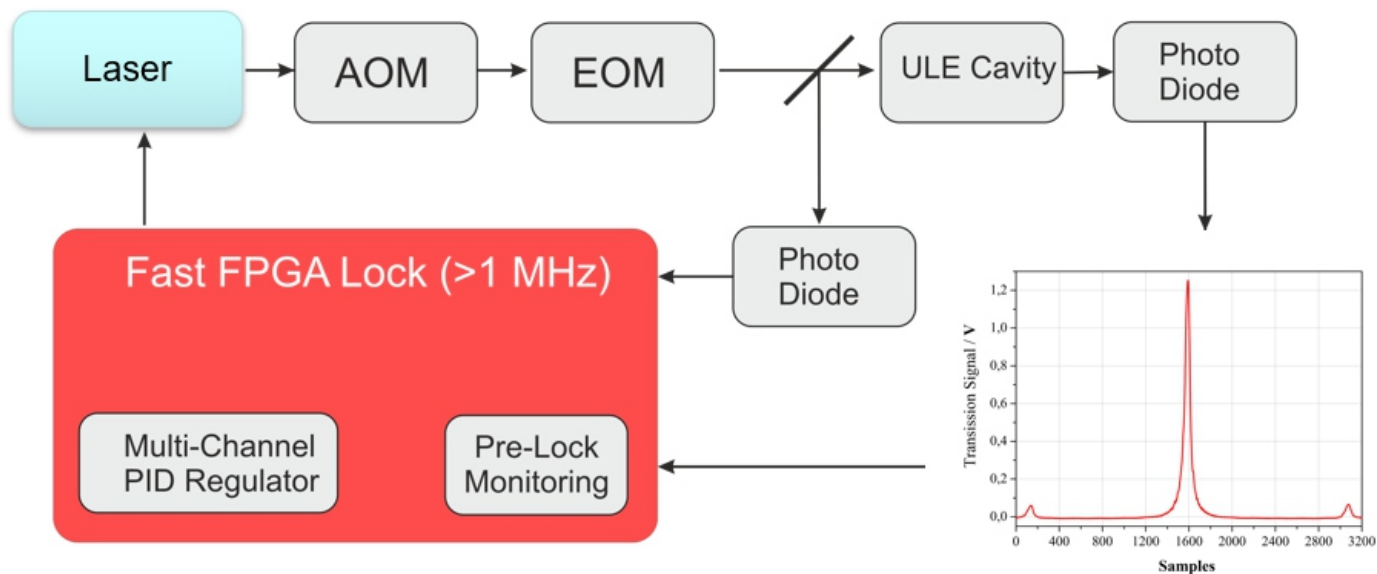
Using our

Micron Laser

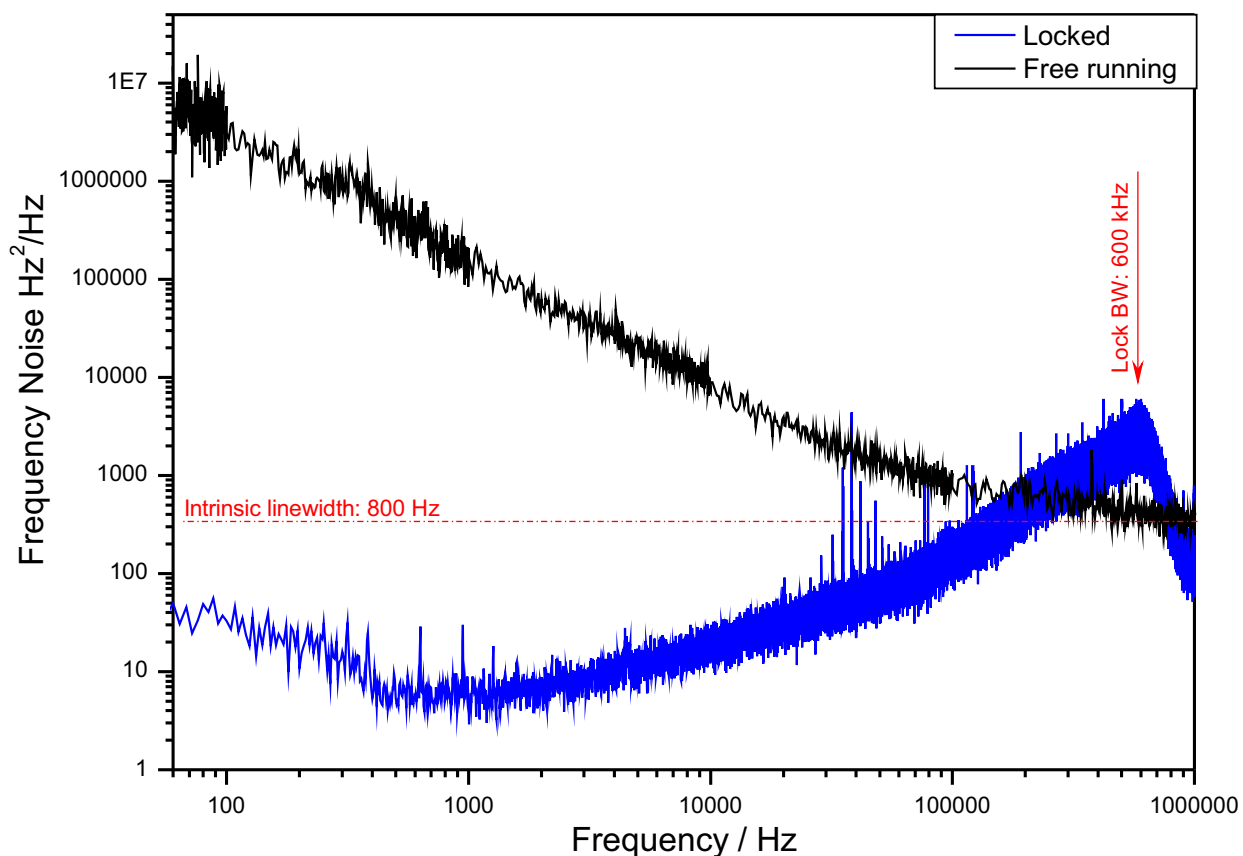
Typical Locking Setup



Finesse: 10500
Q-Value: 1.23×10^9
FSR: 3 GHz
FWHM: 300 kHz
 λ 813 nm

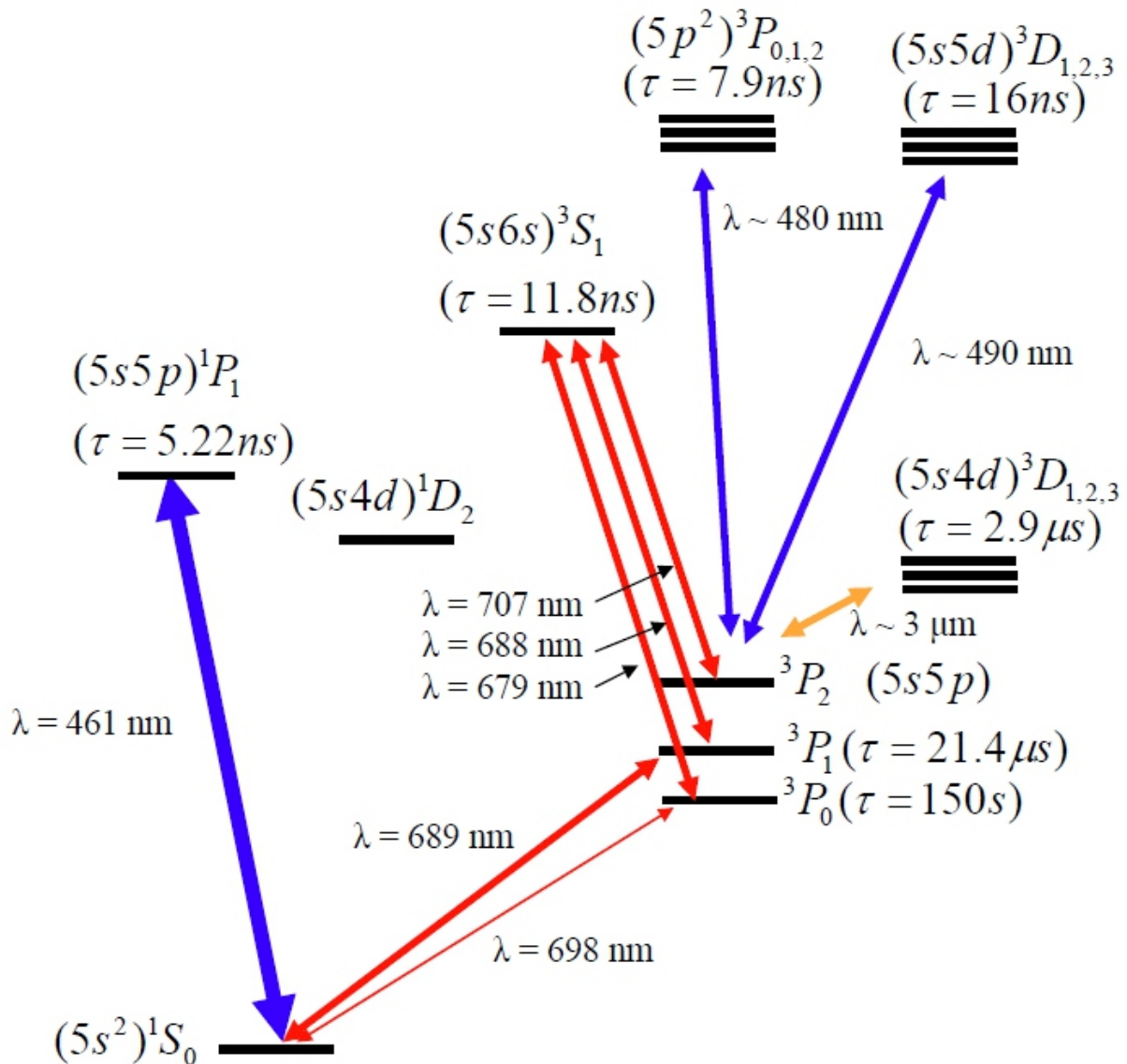


Locking Performance



Application Examples

Strontium Lattice Clocks



About Sacher Lasertechnik

Company Profile

Sacher Lasertechnik is leading manufacturer of tunable external cavity diode lasers (ECDLs) with more than 30 years of experience. We would be proud to support you with our competence.

Please contact us or our local representative

Sacher Lasertechnik
GmbH
Hedwig-Jahnow-Str. 12
D-35037 Marburg/Lahn
Germany
Tel.: +49 6421 305 - 0
Fax: +49 6421 305299

Sacher Lasertechnik
LLC
5765 Equador Way
Buena Park, CA90620
U. S. A.
Tel.: 1-800-352-3639
Fax: 1-714-670-7662

Email: contact@sacher.de
Web: <http://www.sacher.de>

