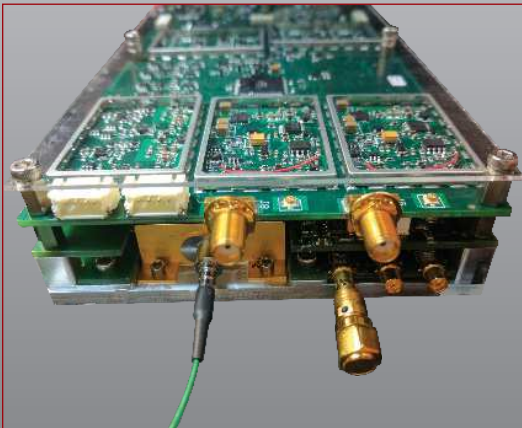


HAL - Heterodyne Agile Laser

Vescent Photonics proudly offers the HAL series of low-SWaP, atom-referenced, frequency-agile lasers. The HAL series of lasers integrates diode laser sources, an alkali metal vapor-based frequency standard, and a heterodyne beat note collection system into a single butterfly package to deliver highly stable tunable light to your quantum sensing devices.

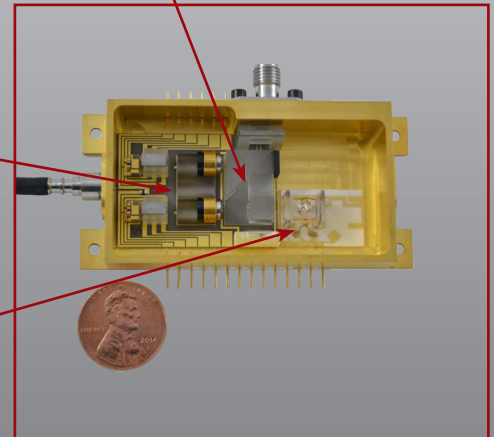
Well known for high-speed, low-noise control electronics as well, we provide stand-alone or integrated electronics configuration that will optimize your system with respect to optical performance, space, power consumption, and thermal management requirements.

We can customize the HAL for your specific needs, including single-laser designs, amplified and shuttered systems, specific form factors, and other wavelengths.



Fully integrated two-laser HAL with fiber-coupled output

Offset phase lock provides agile wavelength control



Master & slave dual diode lasers

Integrated atom-referenced wavelength stabilization

HAL laser interior

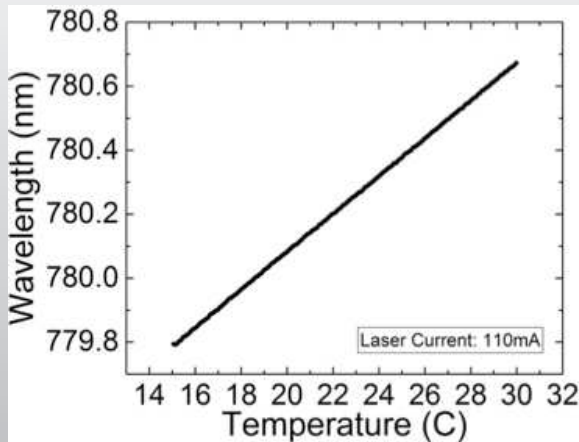
Features:

- Wide mode hop-free tuning:
>9.5 GHz from atom-referenced lock-point
- Excellent frequency stability:
 10^{-12} in 1 s
<10 kHz / day
- Low electrical power draw, <2 W
- <30 cm³ optical package volume
- Computer control via GUI or serial commands
- Fiber-coupled or free-space output

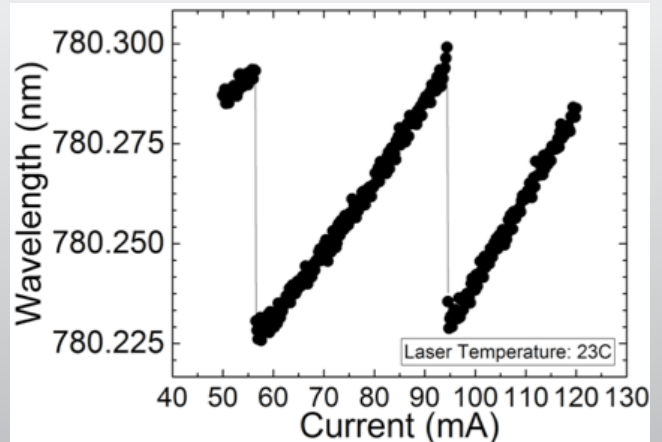
Applications:

- Optical Clocks
- GPS-denied Navigation
- Quantum Computing
- Quantum Cryptography
- Magnetometry
- Frequency Standards

HAL Performance

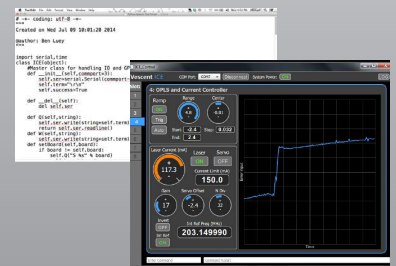


HAL typical temperature tuning



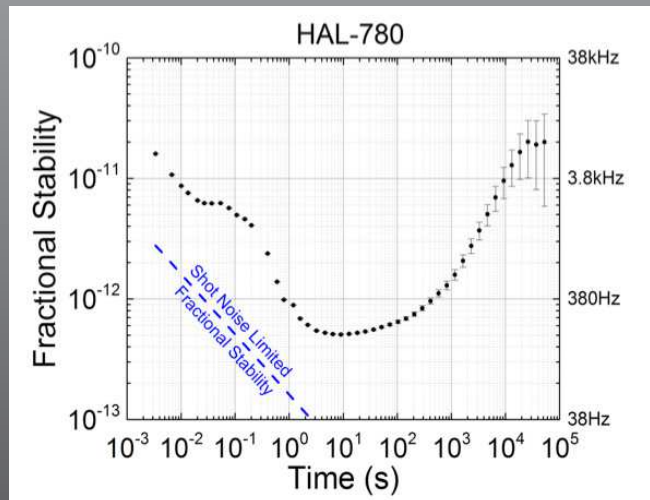
HAL typical current tuning

Performance		Units
Output Center Wavelength	780.24	nm
Fiber-Coupled Output Power	5	mW
Output format	Free-space or PM fiber	
Linewidth	<800	kHz
Mode Hop-Free Tuning Range	>37	GHz
Offset Tuning Range	250 to 9,500	MHz



GUI or API control

All specifications subject to change without notice.



Allan Deviation

1. Monitoring 200 MHz heterodyne signal between two HAL-780 sources
2. Both HAL-780 sources operating with master laser locked to ⁸⁵Rb crossover (3' – 4')

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