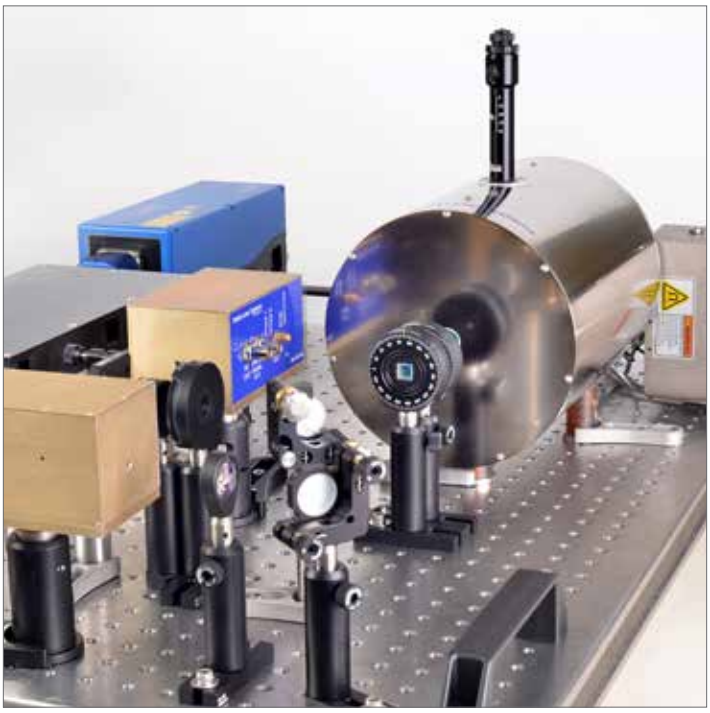
# Premium Stabilized Laser System
# SLS-XXX-300-1

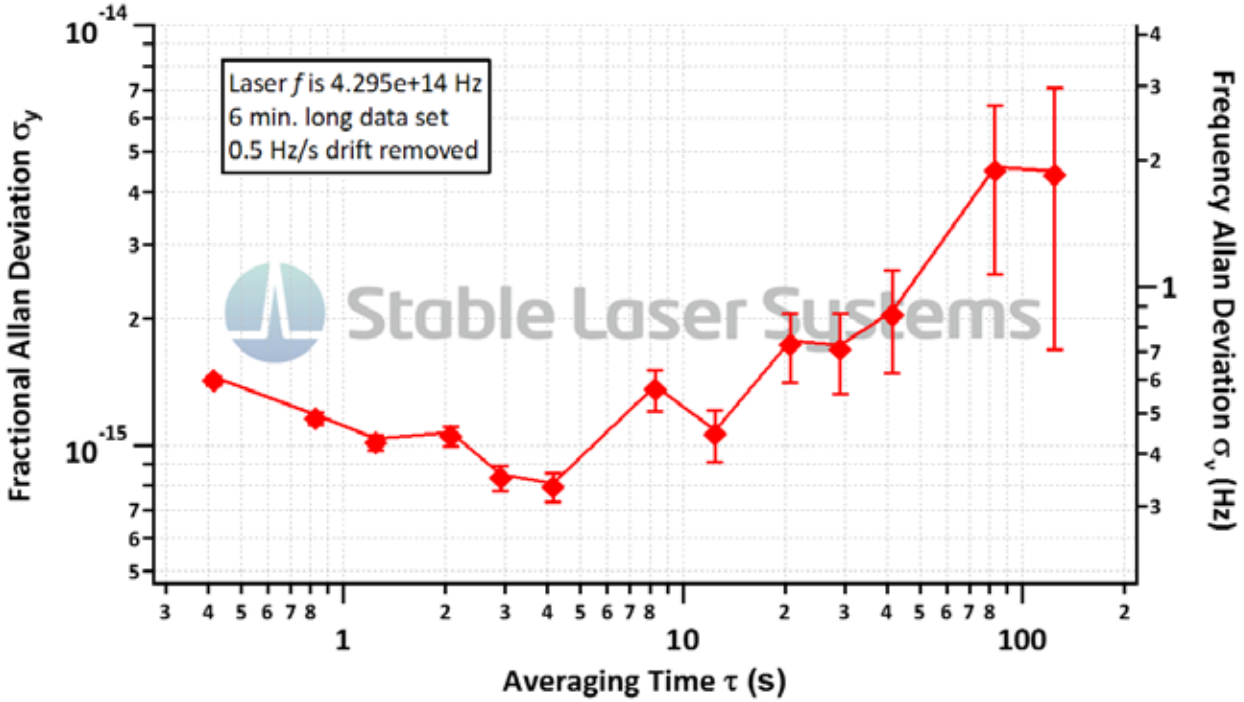
Stable Laser Systems

## CUSTOMIZATION IS OUR SPECIALTY

Stable Laser Systems proudly offers a wide range of complete stabilized laser systems built to suit the user's needs. High-performance systems are available with linewidths less than 1 Hz and less than 20 kHz of daily frequency drift at room temperature. This stellar performance is achieved by use of a notched cylindrical cavity with high-finesse mirrors, which is carefully assembled in our renowned ultra-low drift cavity mount and vacuum housing. The quality of this system is in the details: characterization of the cavity prior to mounting, careful monitoring of cavity temperature and system power output (with transverse cavity mode image for systems below 1100 nm), active vibration isolation, fiber-coupled outputs, measurement of temperature at which cavity thermal expansion coefficient is zero, and more. Our custom frequency stabilized laser systems are carefully engineered to improve access to new fields of research. Our vacuum housing and cavity mounting expertise is at the core of every system, as well as our knowledge of lasers and optics for various wavelength ranges. The output of every stabilized laser system is the frequency stability you need – guaranteed.



Custom stabilized laser assembly operating near the strontium clock transition at 698 nm



# Custom Stabilized Laser System

SPECIFICATIONS

## MONITOR OUTPUT

- PDH error signal
- Reflected power from the cavity
- Transmitted power from the cavity (with image for systems below 1100 nm)
- Vacuum pressure
- Vacuum housing temperature

## ELECTRONICS

| | |
|---|---|
| Operating voltage | 100/115/230 VAC |
| Power consumption | < 100 W |
| Power frequency | 50-60 Hz |
| Cooling requirements | None |
| Thermistors provided | Two: 10 kΩ at 25 °C |
| Heaters provided | 6 Ω, 30 W |

## PERFORMANCE

| | |
|---|---|
| Wavelength range | Custom, per user spec and suitable laser source availability. Available wavelengths with: (698,729, 1032,1064, 1156, 1550, & 1756 nm + others) Additional wavelengths are available upon request. |
| Output power | > 10 mW (typical) |
| Stabilized laser linewidth | < 1 Hz (measured over integration times of 1 s, in a beat or self-heterodyne system with linear drift removed) with better performance on a best-effort basis |
| Daily laser drift | < 20 kHz for operating temperature range |
| Operating temperature range | 18-25 °C |
| Temperature drift | < 7 mK/K of room temperature change |
| Thermal insulation leakage | < 0.3 W/K of room temperature change |
| Cavity mounting accuracy | Within 1 mm of can axis |
| Achievable pressure | < 3×10-7 Torr |
| Cavity Zero Crossing | Direct measurement of the temperature at which cavity's thermal expansion coefficient is zero. Option: this temperature is guaranteed to be greater than room temperature for maximum stability. |

## MECHANICS & OPTICS

| | |
|---|---|
| Input laser | Fiber laser, diode laser, or external cavity diode laser |
| Vibration isolation system | Herzan AVI-350ML |
| Optical cavity | ATF 6020-2 notched cavity, or ATF 6300 soherical cavity. Finesse > 500 000, depending on wavelength. One planar/planar mirror and one 50 cm ROC mirror. |
| Vacuum housing | Aluminum shell with Viton O-ring seals on front flange, indium wire seals on back flange, windows and stainless steel ConFlat tee. Tee has two 1.33" ConFlat fittings with ion pump and all metal valves. |
| Windows | Angled at 2° with respect to can axis; AR coated, R < 0.1 % |
| Vacuum can attachment to table | Dimensions: 80 x 80 x 40 cm |
| Typical optical unit | Dimensions: 80 x 80 x 40 cm Weight: 40-120 kg |
| Typical electronics | Dimensions: 8.5 or 19 inch rack mount boxes Weight: < 20 kg |

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