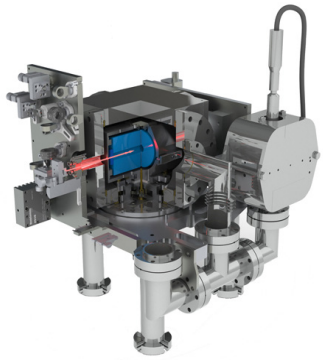
ORS

Ultrastable Laser



The Optical Reference System (ORS) delivers an optical output with ultra narrow linewidth and outstanding short term stability. It consists of a cw laser locked to a stable high-finesse cavity made of ultra low expansion (ULE) glass. The compact design allows for integration of the vacuum chamber, control electronics, vibration isolation platform and acoustic isolation into a 19" rack system and delivers state-of-the-art laser linewidth and stability. Additionally, the system design includes a mechanical locking feature which allows for transportation of the system without the need to readjust the beam coupling into the cavity, once the mechanism is dis-engaged. Every system is fully characterized at Menlo Systems before shipment. The characterization is carried out either against a reference system with equal or better performance, or in a three cornered hat comparison.

KEY SPECIFICATIONS

- Linewidth <1 Hz
- Allan Deviation <0.7-2 x 10^{-15}
- Wavelength range: 500 - 1600 nm
- Finesse ≈ 250 000
- 12 cm cylindrical ULE spacer

APPLICATIONS

- Ultra High Precision Spectroscopy
- Low Noise Microwave Generation
- Interrogation of Optical Clocks
- Frequency Metrology

FEATURES

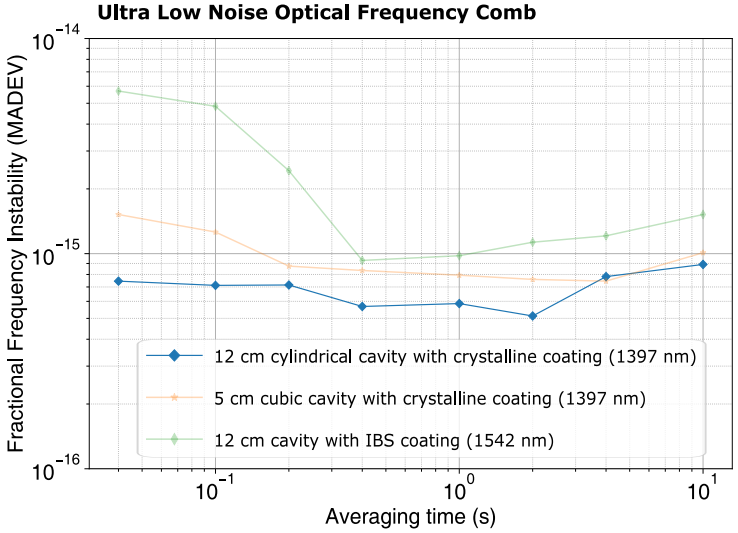
- IBS or crystalline mirror coating
- ULE or fused silica mirror substrate
- ULE compensation rings
- Mechanical Transport Lock
- Active Vibration Isolation Platform
- Acoustic Isolation
- Turnkey Metrology System, designed for contiunuous operation

OPTIONS

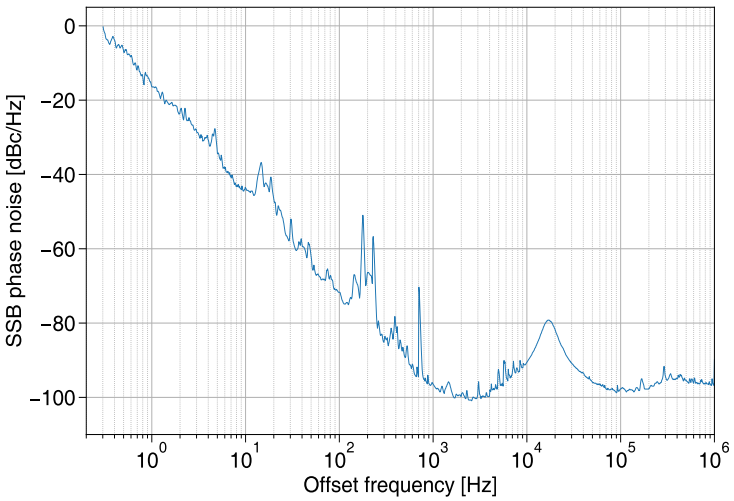
- Doppler cancellation system
- Frequency shifting AOM for operation at exact atomic transition (e.g. Sr at 698 nm)
- Frequency doubling

STABILITY AND PHASE NOISE

Three cornered hat comparison using a Menlo Systems Ultra Low Noise Optical Frequency Comb



Measurement between a 12 cm cylindrical cavity and a 5 cm cubic cavity (both with crystalline coatings at 1397 nm)



ORS

Ultrastable Laser

MenloSystems

SPECIFICATIONS

Wavelength	1542, 1064, 657, 698, 729, 1156 nm and many others between 500-1600 nm
Temperature of Minimal Thermal Expansion	between 20-35 °C
Stabilized Output Power	>10 mW
Finesse	≈ 250 000
Linewidth	<1 Hz
Stability (MADEV at 1s, linear drift removed)	$<2 \times 10^{-15}$ (ULE substrate), $<1 \times 10^{-15}$ (fused silica substrate), $<7 \times 10^{-16}$ (crystalline coatings)
Linear Drift Rate	approx.150 mHz/s
System Dimensions/Weight	590 x 800 x 1600 mm^3 / 260 kg

REQUIREMENTS

Operating Voltage	100 / 115 / 230 VAC
Line Frequency	50 to 60 Hz
Operating Temperature	22 ± 5 °C
Power Consumption	<150 W

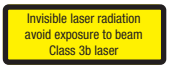
OPTIONS

Fiber Doppler noise cancellation
Frequency doubling
Frequency shifting AOMs for operation at exact atomic transition (e.g. Sr at 698 nm)
Analysis of technical noise floor

ORDERING INFORMATION

Product Code	ORS

Please call for pricing. Specifications are subject to change without notice. Custom modifications are available, please inquire.



MenloSystems

Menlo Systems GmbH
T+49 89 189 166 0
sales@menlosystems.com

Menlo Systems, Inc.
T+1 973 300 4490
ussales@menlosystems.com

Thorlabs, Inc.
T+1 973 579 7227
sales@thorlabs.com

www.menlosystems.com

D-ORS-EN 14/12/20