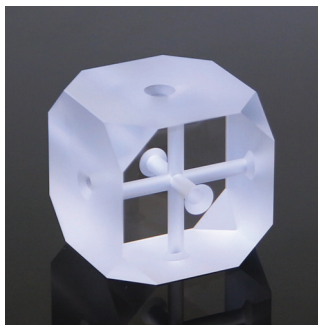
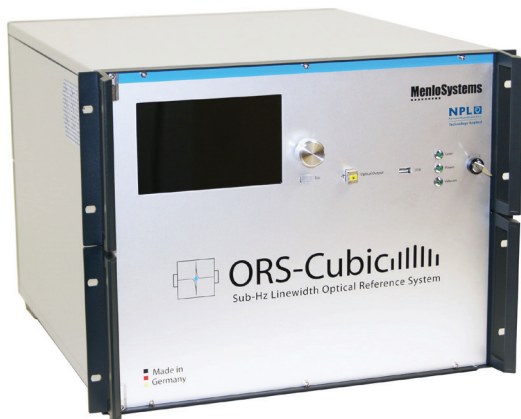


ORS-Cubic

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. The ORS-Cubic is based on the rigidly mounted 5 cm cubic cavity developed in cooperation with the National Physical Laboratory. The rigid mounting of the cubic cavity allows for transportation of the system without the need to readjust the beam coupling into the cavity. 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.

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KEY SPECIFICATIONS

- Linewidth <1 Hz
- Allan Deviation $<0.8-5 \times 10^{-15}$
- Wavelength Range: 500-1600 nm
- Finesse $\approx 250\,000$
- 5 cm Cubic ULE Spacer

APPLICATIONS

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

FEATURES

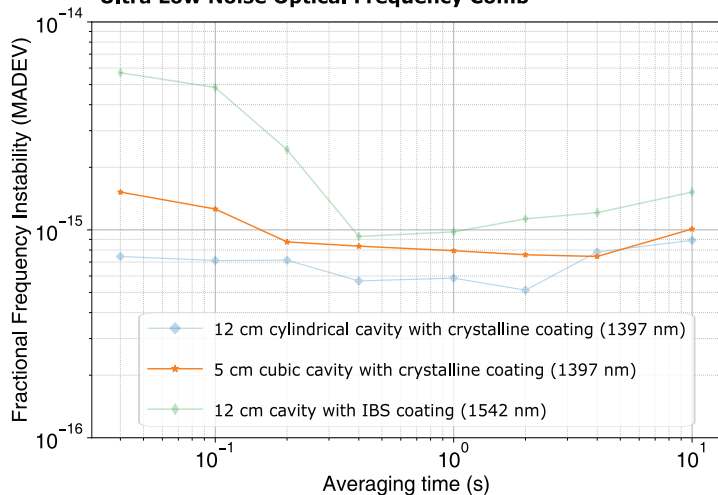
- IBS or Crystalline Mirror Coating
- ULE or Fused Silica Mirror Substrate
- ULE Compensation Rings
- Rigidly Mounted Cavity
- Active Vibration Isolation Platform
- Acoustic Isolation
- Turnkey Metrology System, designed for continuous operation

OPTIONS

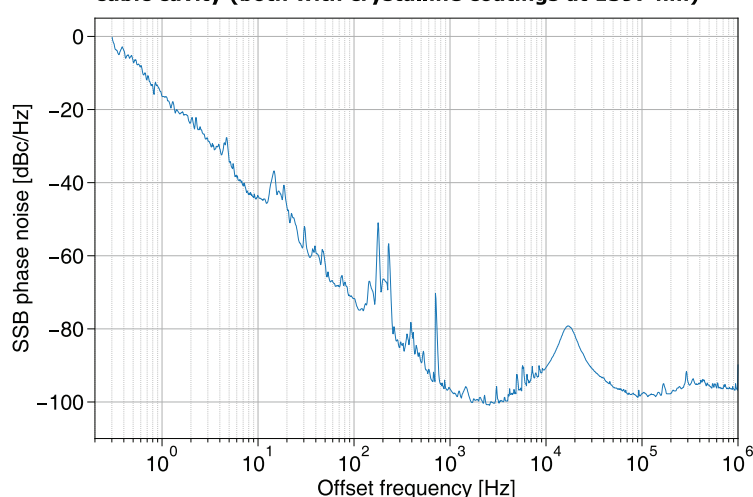
- Doppler cancellation system
- Active RAM cancellation
- Frequency shifting AOM for operation at exact atomic transition (e.g. Sr at 698 nm)
- Frequency doubling

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-Cubic

Ultrastable Laser

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SPECIFICATIONS	ORS-CUBIC	ORS-CUBIC HIGH PERFORMANCE
Wavelength	1542 and 1064 nm	1542, 1064, 657, 698, 729, 1156 nm and many others between 500-1600 nm
Temperature of Minimal Thermal Expansion	between 20-35 °C	between 20-35 °C
Stabilized Output Power	>10 mW	>10 mW
Finesse	≈ 250 000	≈ 250 000
Linewidth	<1 Hz	<1 Hz
Stability (MADEV at 1 s, linear drift removed)	<5 x 10 ⁻¹⁵	<3 x 10 ⁻¹⁵ <8 x 10 ⁻¹⁶ (with crystalline coatings)
Linear Drift Rate	approx. 150 mHz/s	approx. 150 mHz/s
System Dimensions	19" rack mountable, 8HU	19" rack, with 12 -16 HU (height depends on laser) 12 HU for compact ECDLs at 1550 & 1064 nm and 16 HU for cateye ECDLs.
System Weight	50 kg	approx. 180 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
Active RAM suppression
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-Cubic
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Please call for pricing. Specifications are subject to change without notice. Custom modifications are available, please inquire.

This configuration of the NPL cavity is intended for terrestrial use only. For further information on space-customised or space-qualified cavities, please contact NPL.

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Invisible laser radiation
avoid exposure to beam
Class 3b laser

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