



LaserCal is a data acquisition and analysis package for calibrating and characterizing optical frequency standards. It consists of two sub-programs – an Allan Variance program and a matrix frequency-calibration program. It is designed principally to calibrate 633 nm lasers using a Model 100 Iodine-Stabilized Laser as a reference, but can also be used to measure Allan Variances of lasers operating at other wavelengths.

LaserCal Features

- Windows XP compatible
- Supports Agilent 53181A frequency counter
- Uses industry-standard National Instruments IEEE-488 (GPIB) interfaces and drivers
- Allan Variance program characterizes primary or secondary laser frequency standards of all wavelengths
- Matrix measurement program calculates matrix frequency difference of 633 nm iodine-stabilized He-Ne lasers

LaserCal - Matrix Frequency Measurement 04-Feb-00 22:10

		Laser #2			
		d	e	f	g
Laser #1	d		12.8695 ± 0.0010 + 0.0085	26.2344 ± 0.0010 + 0.0104	39.4331 ± 0.0007 + 0.0111
	e	12.8700 ± 0.0008 + 0.0090		13.3679 ± 0.0009 + 0.0049	26.5672 ± 0.0008 + 0.0062
	f	26.2308 ± 0.0012 + 0.0068	13.3614 ± 0.0008 - 0.0016		13.2022 ± 0.0011 + 0.0042
	g	39.4335 ± 0.0008 + 0.0115	26.5629 ± 0.0008 + 0.0019	13.1978 ± 0.0009 - 0.0002	

Peak Interval Errors:

Laser #1

d - e 5.2 kHz
e - f -0.1 kHz
f - g 4.1 kHz

Laser #2

d - e 9.0 kHz
e - f 2.0 kHz
f - g 1.0 kHz

Freq Diff (Laser 1 - Laser 2): 1.5 kHz
Standard Deviation: 1.4 kHz

	<u>Laser #1</u>	<u>Laser #2</u>
Serial Number	WEO 001	WEO 172
Cell Number	180 S	287 S
Cell Temp (°C)	15.0	15.0
Output Power (µW)	91	116
Mod Ampl (MHz pp)	6.0	6.0

Print Screen

Clear Data

Setup Counter

Exit

The Matrix frequency calibration sub-program calculates the frequency difference of 633 nm iodine-stabilized He-Ne lasers using hyperfine components 'd' through 'g'.

Setup Parameters

<p>Wavelength</p> <ul style="list-style-type: none"> <input type="radio"/> 514 nm <input type="radio"/> 532 nm <input type="radio"/> 543 nm <input type="radio"/> 612 nm <input checked="" type="radio"/> 633 nm <input type="radio"/> 780 nm <input type="radio"/> 852 nm <input type="radio"/> Other... <p style="border: 1px solid black; padding: 2px;">633 nm</p>	<p>Reference Laser:</p> <ul style="list-style-type: none"> <input type="radio"/> 'd' <input checked="" type="radio"/> 'e' R(127)11-5 Component 	<p>Laser Under Test</p> <ul style="list-style-type: none"> <input type="radio"/> Primary Standard <input checked="" type="radio"/> Secondary Standard <p><input checked="" type="radio"/> Red Side</p>	<p>Enter</p> <p>Default Settings 1</p>
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Setup Counter

<p>Input Channel</p> <ul style="list-style-type: none"> <input checked="" type="radio"/> Ch 1 <input type="radio"/> Ch 2 	<p>Input Coupling</p> <ul style="list-style-type: none"> <input checked="" type="radio"/> AC <input type="radio"/> DC 	<p>Counter Type</p> <p>HewlettPackard 53181A</p>
<p>Trigger Level</p> <ul style="list-style-type: none"> <input checked="" type="radio"/> 0 Volts <input type="radio"/> Auto 		<p># of Data Points</p> <p>100</p>
<p>Impedance</p> <ul style="list-style-type: none"> <input checked="" type="radio"/> 50 Ohm <input type="radio"/> 1 M Ohm 		<p>Gate Time</p> <p>1</p>
<p>Enter</p>		<p>Cancel</p>
<p>Initialize Counter</p>		<p>Reset GPIB</p>

Pop-up windows allow easy access to frequency counter settings and other program parameters.