



CSA Wavelength Performance Operating with the TLS-650 Tunable Laser

PRELIMINARY

Overview

This application note documents performance of the CSA with the TLS-650 (New Focus 6528) tunable laser.

Summary

The TLS-650 laser is a combination stepping or sweeping tunable laser. It performs very well with the dBm Optics CSA. The sweep tends to be reasonably linear. The start point of the sweep has both an offset and jitter, but these are both corrected for by the dBm Dynamic Wavelength Meter OMM-410.

The overall accuracy one should expect is shown below:

OMM-410 Dynamic Wavelength Meter?	Absorption Cell Correction?	Mode-Hop Correction Enabled? ¹	Trigger delay correction?	Inside Mode Hope Free Range?	Typical Wavelength Error
Yes	Yes	NA	NA	Yes	+/- 1.8pm
Yes	No	NA	NA	Yes	+/- 5pm
No	No	NA	Yes	Yes	5pm +/- 25pm
No	No	NA	No	Yes	40pm +/- 25pm
Yes	Yes	Yes	Yes	No	+/- 1.8pm
Yes	NA	No	NA	No	+/- 20-40pm
No	No	No	Yes	No	5 pm +/- 10-65pm
No	No	No	No	No	40 pm +/- 10-65pm

1. Available soon

Test Scenario

The following data was taken with the following conditions

Parameter	Conditions
Wavelength range of sweep	1525-1565 nm
Sweep type	Continuous
Sweep rate	100 nm/sec
Sweep time	< ½ second
Wavelength resolution of measurement	2 pm
Measurement points per sweep	20,000
Total number of sweeps	61
Total time period for test	3 hours, 52 minutes
Total number of measurements	1.22 million
CSA configuration	2004 Mainframe, 2 OMM-202 measurement channels, 1 OMM-410 Dynamic Wavelength Module
Wavelength verification device	HCN gas absorption cell

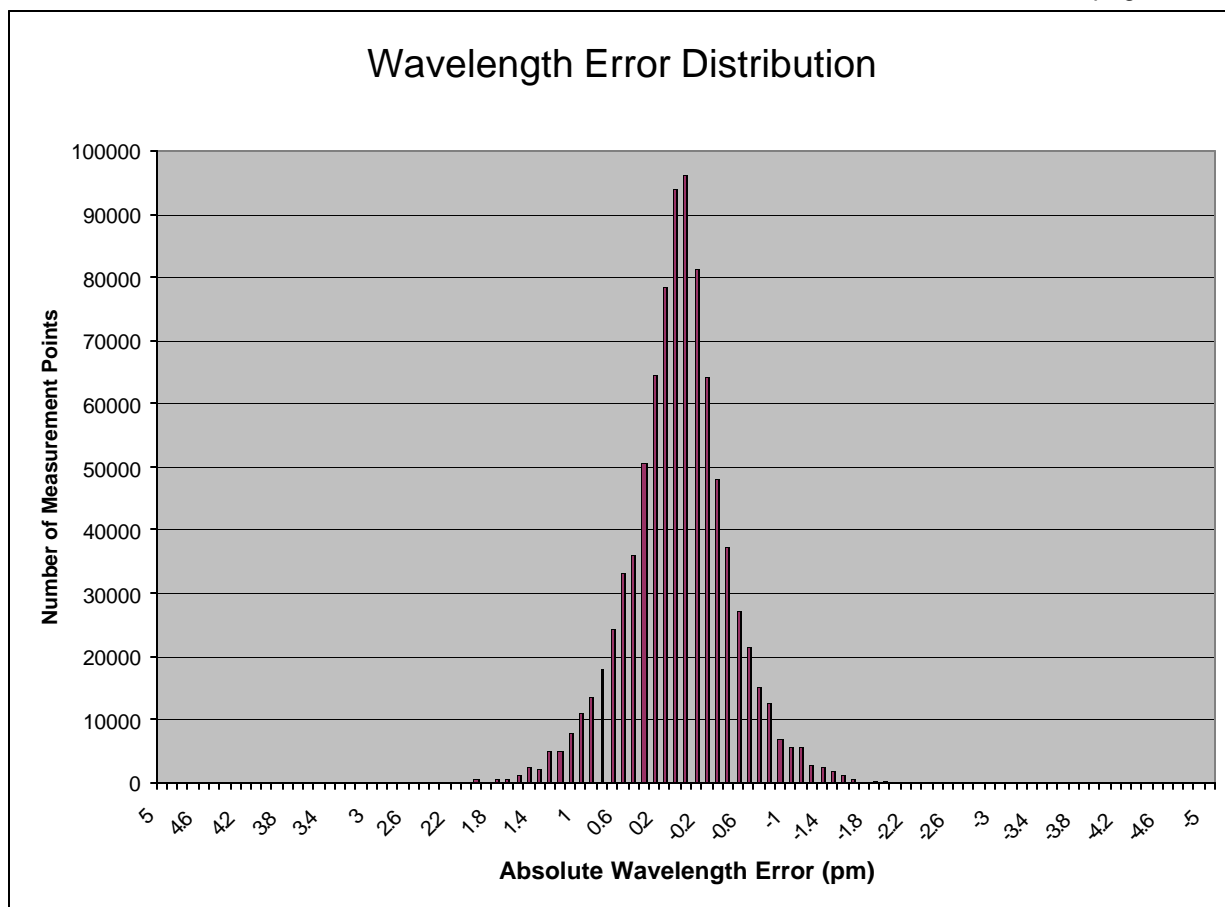
Prior to the initial sweep, the CSA was configured to “Learn” the test setup using an HCN cell. Several sweeps were run to provide the CSA with the correction tables, which it builds automatically.

For the test, the sweeps were run over a period of almost 4 hours.

Wavelength Error Distribution

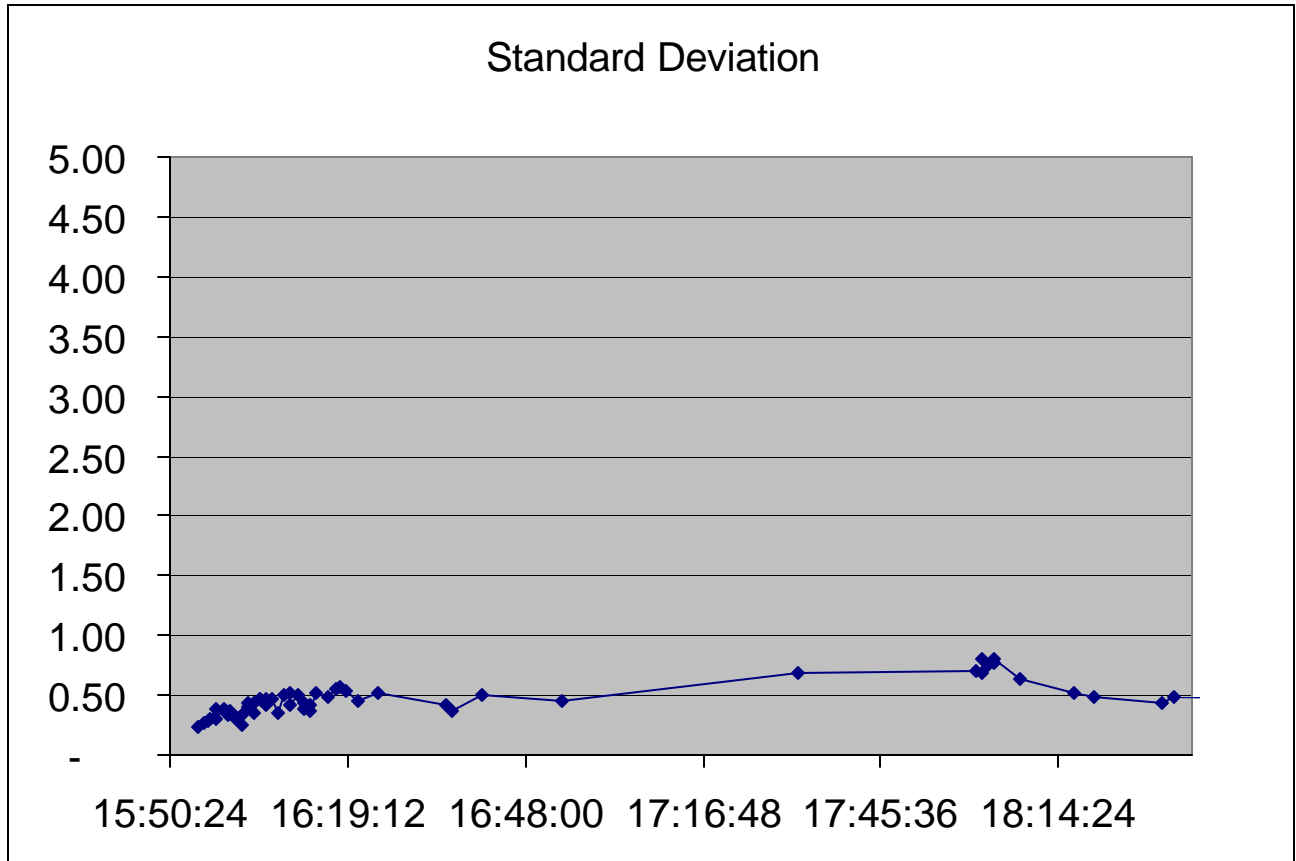
The standard deviation of the error of all the measurements was 0.48 pm. The 3 sigma point is 1.44 pm.

The distribution of the errors of all the measurements made is shown in the table on the next page.



Wavelength Error Drift

The wavelength did not show an appreciable drift over time. The standard deviation of each sweep's errors moved from ~0.3 pm at the beginning to ~0.7 pm at about 2.5 hours, back down to ~0.45 at the end of the test sequence.



© 2001-2005 dBm Optics, Inc.



dBm Optics, Inc.
300 South Public Rd
Lafayette, CO 80026
303-464-1919
www.dbmoptics.com



CSA Wavelength Performance Operating with the TLS-650 Tunable Laser

PRELIMINARY

Overview

This application note documents performance of the CSA with the TLS-650 (New Focus 6528) tunable laser.

Summary

The TLS-650 laser is a combination stepping or sweeping tunable laser. It performs very well with the dBm Optics CSA. The sweep tends to be reasonably linear. The start point of the sweep has both an offset and jitter, but these are both corrected for by the dBm Dynamic Wavelength Meter OMM-410.

The overall accuracy one should expect is shown below:

OMM-410 Dynamic Wavelength Meter?	Absorption Cell Correction?	Mode-Hop Correction Enabled? ¹	Trigger delay correction?	Inside Mode Hope Free Range?	Typical Wavelength Error
Yes	Yes	NA	NA	Yes	+/- 1.8pm
Yes	No	NA	NA	Yes	+/- 5pm
No	No	NA	Yes	Yes	5pm +/- 25pm
No	No	NA	No	Yes	40pm +/- 25pm
Yes	Yes	Yes	Yes	No	+/- 1.8pm
Yes	NA	No	NA	No	+/- 20-40pm
No	No	No	Yes	No	5 pm +/- 10-65pm
No	No	No	No	No	40 pm +/- 10-65pm

1. Available soon

Test Scenario

The following data was taken with the following conditions

Parameter	Conditions
Wavelength range of sweep	1525-1565 nm
Sweep type	Continuous
Sweep rate	100 nm/sec
Sweep time	< ½ second
Wavelength resolution of measurement	2 pm
Measurement points per sweep	20,000
Total number of sweeps	61
Total time period for test	3 hours, 52 minutes
Total number of measurements	1.22 million
CSA configuration	2004 Mainframe, 2 OMM-202 measurement channels, 1 OMM-410 Dynamic Wavelength Module
Wavelength verification device	HCN gas absorption cell

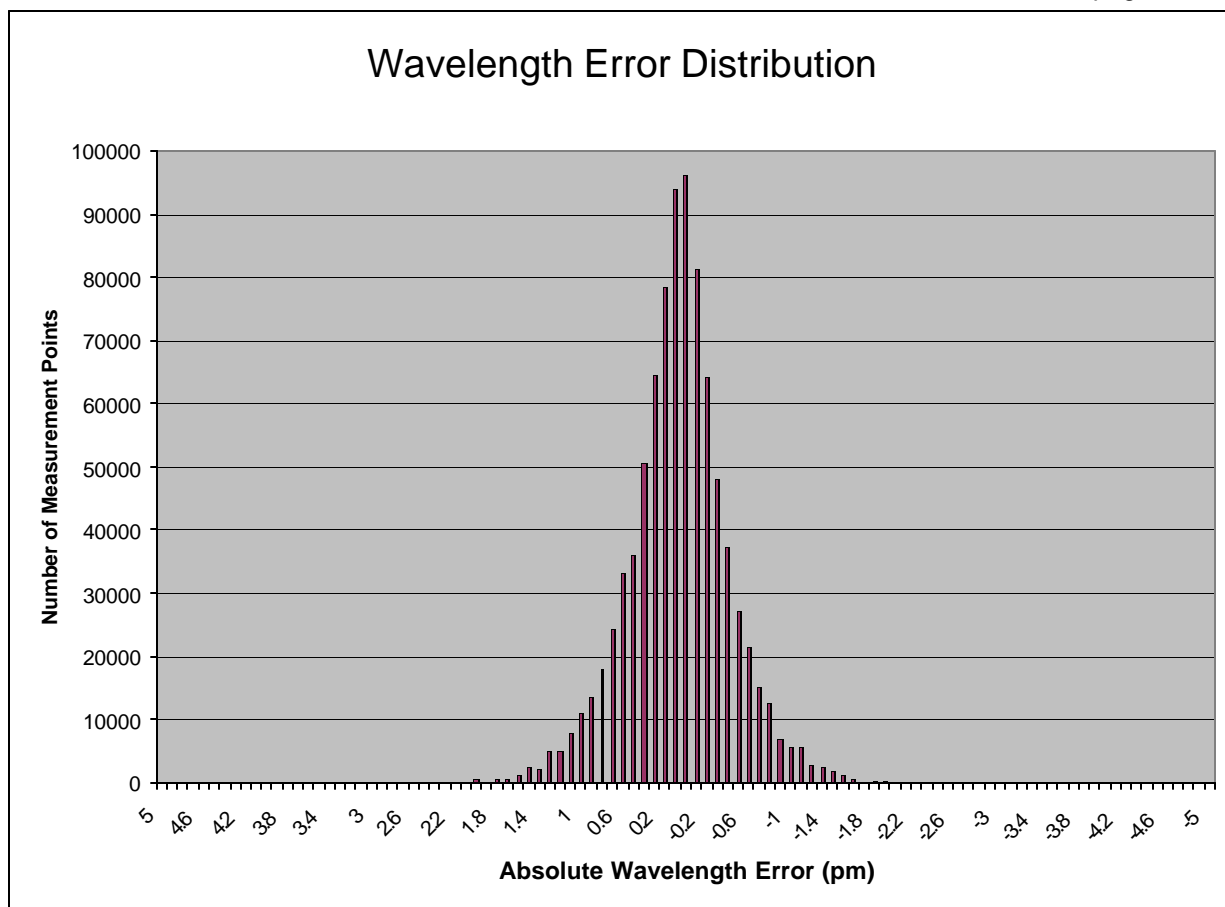
Prior to the initial sweep, the CSA was configured to “Learn” the test setup using an HCN cell. Several sweeps were run to provide the CSA with the correction tables, which it builds automatically.

For the test, the sweeps were run over a period of almost 4 hours.

Wavelength Error Distribution

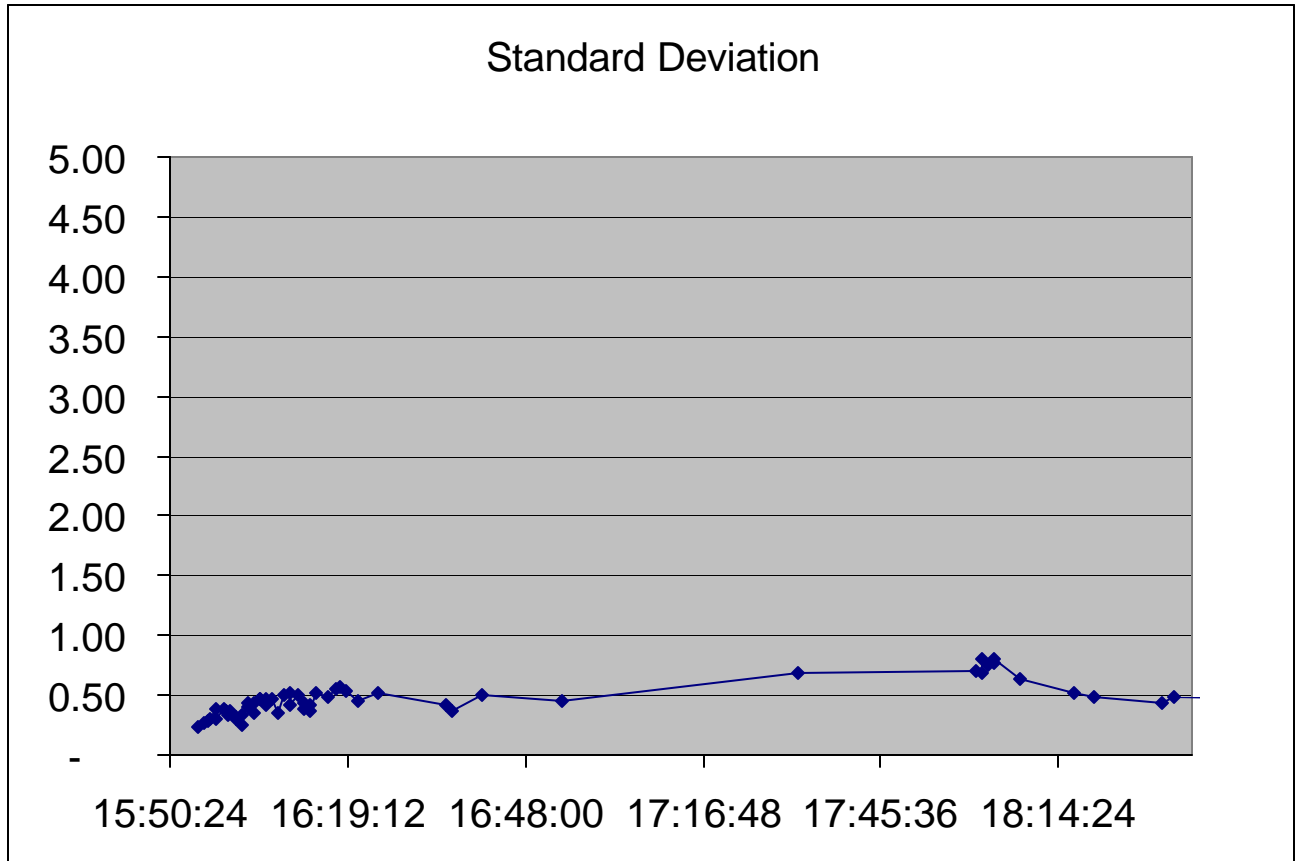
The standard deviation of the error of all the measurements was 0.48 pm. The 3 sigma point is 1.44 pm.

The distribution of the errors of all the measurements made is shown in the table on the next page.



Wavelength Error Drift

The wavelength did not show an appreciable drift over time. The standard deviation of each sweep's errors moved from ~0.3 pm at the beginning to ~0.7 pm at about 2.5 hours, back down to ~0.45 at the end of the test sequence.



© 2001-2005 dBm Optics, Inc.



dBm Optics, Inc.
300 South Public Rd
Lafayette, CO 80026
303-464-1919
www.dbmoptics.com