

Sanders Research Group

Announcement

New Multiwavelength TDM Source

We are pleased to announce a new time-division multiplexed (TDM) source.

Multiwavelength TDM lasers enable cost-effective and versatile optical sensors.

We recently developed a new TDM laser system that continuously cycles through N spectrally narrow wavelengths, spending a specified, fixed time on each one.

Features:

Property	min	typ	max
number of wavelengths N ¹	1	3-100	1000
center wavelength ¹	700 nm	-	1700 nm
spectral linewidth of each channel	-	-	1 GHz
long term spectral drift of each channel	-	-	1 GHz
tuning range of each channel	-	1 nm	15 nm
fiber coupled output power ¹	-	10-100 mW	-
time to cycle through all N colors	100 ns	20 μ s	1 ms
minimum detectable absorbance (MDA)	-	10^{-4}	-

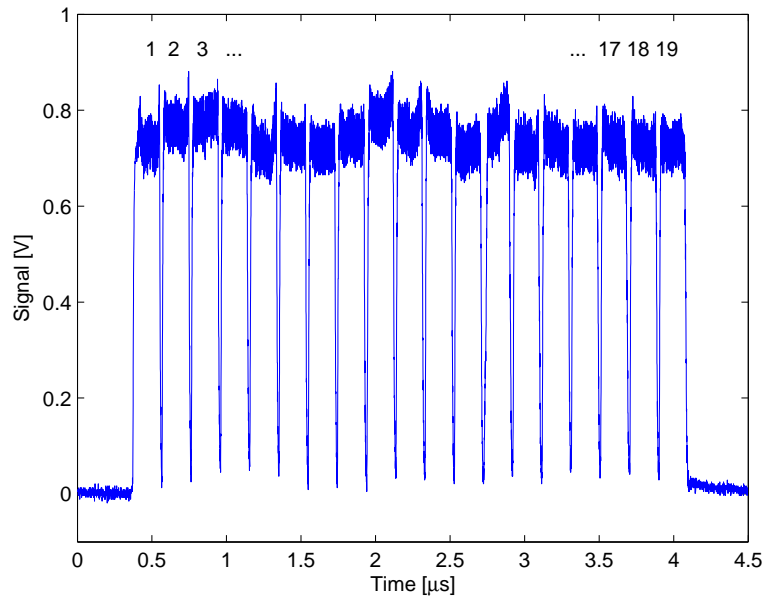
- simple: a single gain element supports all wavelengths²
- low cost
- independent power controls: easily achieve equal power at each wavelength or any custom spectral profile
- rugged, portable, no moving parts
- polarized output available

Applications:

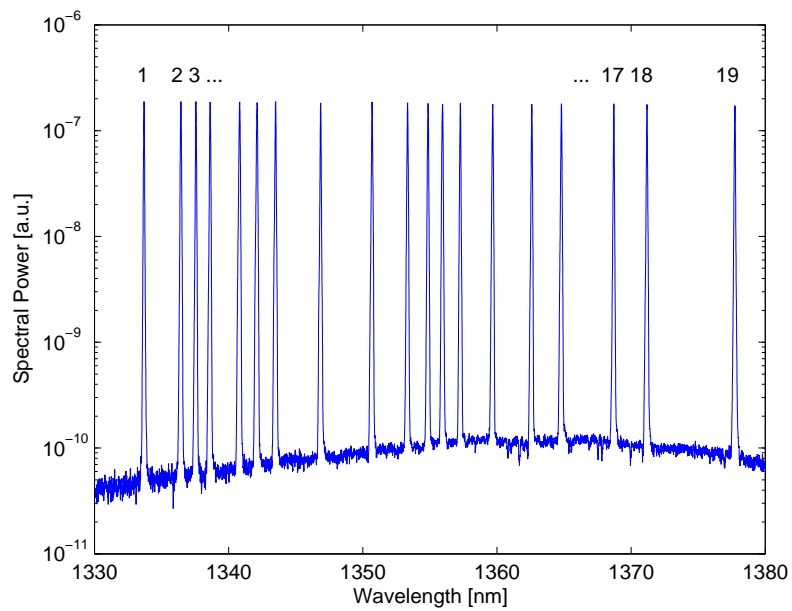
- Absorption spectroscopy / tomography
- Gas sensing
- Simplification / extension of systems based on N diode lasers
- Instrumentation, test and measurement
- Wavelength-encrypted communication

Example 19-color TDM Laser:

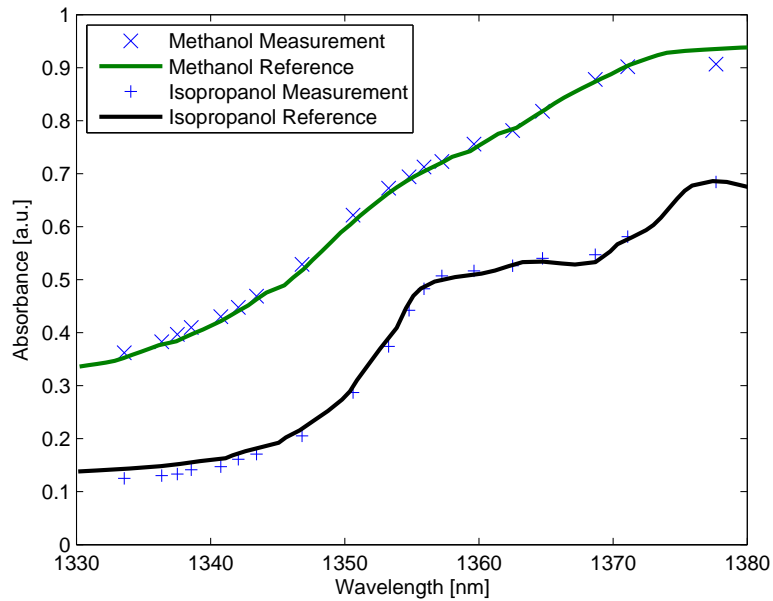
- Below are 19 pulses of ~ 200 ns duration. Each pulse is at a unique wavelength in the 1330-1380 nm range.



- Flat spectrum recorded with an optical spectrum analyzer



- Single shot absorbance measurement of liquid phase methanol and isopropanol. The standard deviation of 100 consecutive shots with a repetition rate of 66 kHz was only ~ 0.0013 .



Please forward this link to other interested parties:

http://www.engr.wisc.edu/me/faculty/sanders_scott/TDM_flyer.pdf

Scott T. Sanders
 Associate Professor
 Mechanical Engineering Department
ssanders@engr.wisc.edu

Thilo Kraetschmer
 Graduate Researcher
 Mechanical Engineering Department
kraetschmer@wisc.edu

Faculty profile: http://www.engr.wisc.edu/me/faculty/sanders_scott.html
 Optical diagnostics at the ERC: http://www.erc.wisc.edu/advanced_diagnostics/optical_diagnostics.html
 Center for hyperspectral photonics (CHyP): <http://chyp.erc.wisc.edu>

¹ specifications beyond this range are possible; please contact us for more information

² multiple gain media can be used if the user-specified wavelengths exceed the gain bandwidth of available gain media