



Modeless Wavelength-Agile Laser

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WARF: P05034US

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing an easily constructed modeless laser with a rapidly sweeping color that results in improved performance in many sensing applications.

Overview

Spectroscopic studies evaluate the response of a specimen to different colors of light. Lasers are normally used in spectroscopic studies; however, lasers typically operate in one or more cavity modes, which can result in “speckle,” where light from the laser constructively adds or destructively cancels at given points. Another related issue is “mode hopping,” where laser light at one color jumps to another, substantially different color instead of scanning smoothly through them.

The Invention

A UW-Madison researcher has developed an easily constructed modeless laser with a rapidly sweeping color that results in improved performance in many sensing applications. The laser changes its cavity length at a speed that prevents the formation of modes, resulting in a spectrally narrow, swept-wavelength light source that eliminates mode hopping. A pivoting mirror design provides the high rate of cavity length change.

Applications

- Optical coherence tomography, a non-invasive technique used for high resolution, cross-sectional imaging and tissue characterization
- Gas sensing, including measuring gas properties in engines
- Many other rapid spectroscopic sensing applications

Key Benefits

- Modeless operation eliminates mode hopping and speckle.
- Allows smoother and more reliable sweeping of light frequency with less variation in amplitude from scan to scan
- Rapid sensing speed – up to once every 32 microseconds
- Relatively simple to construct
- Laser system may be implemented to produce variable wavelength scanning speeds.

Additional Information

For More Information About the Invention

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Tech Fields

- Analytical Instrumentation, Methods & Materials : General analytical instrumentation

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- [Analytical Instrumentation, Methods & Materials : Lasers](#)
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