Multi-Wavelength, Laser Array

Tech ID: 31653 / UC Case 2019-294-0

ABSTRACT

Researchers at the University of California, Davis have developed a multi-wavelength, laser array that generates more precise wavelengths than current technologies. The array also delivers narrow linewidths and can operate athermally.

FULL DESCRIPTION

High-traffic telecom and data communications applications benefit from narrow-spectral linewidth and low-noise laser operations. However, many current technologies lack these characteristics to the degree desired by industry. Wide linewidths and imprecise wavelengths can create operational inefficiencies. Many current system configurations also have specific operational temperature ranges, and require the use of multiple control loops – increasing both equipment needs and associated costs.

Researchers at the University of California, Davis have designed a multi-wavelength, laser array that can deliver more precise wavelengths and narrow linewidths. This technology can produce wavelengths spaced at precise frequency spacing with either one or no control loop. It also eliminates the need to control each wavelength individually. The narrow linewidth allows optimized laser power and lowers the noise of the signal. Additionally, since the optical wavelength de-multiplexer and the optical resonator can be produced from the same material, they will always operate at the same wavelength, even if temperature variations vary that wavelength. The use of an athermal waveguide thus allows for temperature-independent operation.

APPLICATIONS

- Accurate and stable, multi-wavelength, laser array
- High-traffic telecom and data communications

FEATURES/BENEFITS

- More accurate and stable, multi-wavelength, laser output
- Narrow spectral linewidth optimizes power output of the signal
- Precise and low-noise wavelength
- Possible athermal/uncooled operation
- Eliminates the need for individual wavelength control and – in some cases – distributed feedback structures
- Manufactured via lower-cost and less-complicated processes than current technologies

PATENT STATUS

Patent Pending

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OTHER INFORMATION

KEYWORDS

Lases, Athermal, Denoising, De-multiplexer, Array

CATEGORIZED AS

- **Optics and Photonics**
  - All Optics and Photonics
- **Communications**
  - Networking
  - Optical
  - Other
- **Engineering**
  - Other

RELATED CASES

2019-294-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Higher-Speed and More Energy-Efficient Signal Processing Platform for Neural Networks
- Crystal Orientation Optimized Optical Frequency Shifter
- Hyperspectral Compressive Imaging
- Multi-Wavelength, Nanophotonic, Neural Computing System
- Athermal Nanophotonic Lasers
- Ultra-High Resolution Multi-Platform Heterodyne Optical Imaging
- Optical Interposers for Embedded Photonics Integration
- Ultrahigh-Bandwidth Low-Latency Reconfigurable Memory Interconnects by Wavelength Routing
- Development of a CMOS-Compatible, Nano-photonic, Laser
- Energy Efficient and Scalable Reconfigurable All-to-All Switching Architecture
- Compressive High-Speed Optical Transceiver
- All-Optical Regenerators
- Tensorized Optical Neural Network Architecture
- Silicon Based Chirped Grating Emitter for Uniform Power Emission
- Energy-Efficient All-Optical Nanophotonic Computing
- 3D Photonic and Electronic Neuromorphic Artificial Intelligence
- Adapting Existing Computer Networks to a Quantum-Based Internet Future

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