

# All-Optical Regenerators

Tech ID: 11239 / UC Case 2003-538-0

## ABSTRACT

Reconfigurable multi-channel all-optical regenerators.

## FULL DESCRIPTION

Researchers at the University of California, Davis have developed an all-optical regenerator based on a Mach-Zehnder interferometer. The device is a novel solution to the old problem of optical signal strength dissipation over long distances. It resolves this issue by receiving weak signals, analyzing the data, and regenerating a new optical carrier to be further transmitted. The device does not rely on flawed amplification techniques that magnify not only the signal but also the background noise. Furthermore, it's all-optical nature eliminates the need for conversion of the optical signal to electrical and back. This has huge advantages over other optical-electrical regenerators because it can be easily scaled to large networks, and the simplicity of the design allows this technology to be implemented on a single integrated chip.

## APPLICATIONS

- ▶ Boost optical signal strength
- ▶ Send data over longer distances with reduced introduction of noise

## FEATURES/BENEFITS

- ▶ Low signal to noise ratio
- ▶ Highly scalable
- ▶ Amenable to Mass production

## PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	7,099,586	08/29/2006	2003-538

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## INVENTORS

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## OTHER INFORMATION

### KEYWORDS

optical, regenerator,  
  
Mach, Zehnder,  
  
interferometer, signal  
  
strength, fiber, optic

### CATEGORIZED AS

- ▶ **Communications**
  - ▶ Internet
  - ▶ Networking
  - ▶ Wireless
- ▶ **Computer**
  - ▶ Hardware
- ▶ **Optics and Photonics**
  - ▶ All Optics and Photonics

### RELATED CASES

2003-538-0

## 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
- ▶ Multi-Wavelength, Laser Array
- ▶ 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
- ▶ 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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