



# University of Central Florida

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## Digital Backward Propagation Method

When an optical signal travels through a fiber channel, the fiber introduces various types of distortion. UCF researchers have developed a method to compensate for this optical distortion, using backward propagation in the electrical domain to restore optical signal quality/integrity. The received signal, distorted by imperfections in the physical channel, is processed by modeling channel parameter values that are opposite to those of the distortion-causing physical channel. By modifying the physical channel distorted signal with the same effect a converse physical channel would have, this development can restore signal as if it had been transmitted through a perfect physical channel.

Examples of impairments include fiber dispersion, self-phase modulation or SPM (an intra-channel impairment), cross-phase modulation or XPM (an inter-channel impairment), and four-wave mixing or FWM (another inter-channel impairment).

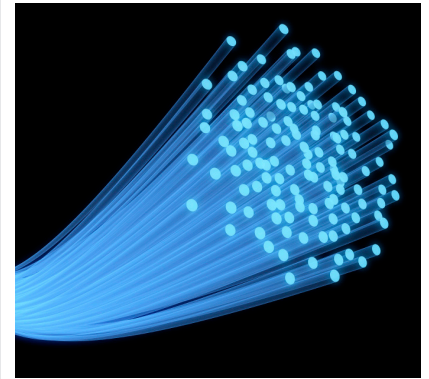
### Technical Details

In this new method, distorted optical signal is demultiplexed by a frequency demultiplexer and provided to one or more optical detectors, which convert the distorted optical signal to a signal in the electrical domain. The distorted electrical signal is processed in the electrical (digital) domain by impairment compensation logic to remove distortion produced in the optical (physical) domain. Carried within the demultiplexed and compensated electrical signal is data that is a replica or near replica of the originally transmitted data.

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*Also, see related technology "Digital Backward Propagation for WDM Systems" ID# 31726*



### Benefits

- Compensates for optical signal impairments caused by channel impairments

### Applications

- Optical communications

### Tech Fields

Communications

### Keywords

optical transmission systems, backward propagation, transmission impairments, digital signal processing, post-compensation

### US Issued Patent

8,447,191 B2

**If you or your company are interested in this opportunity, Contact:**

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