UNIVERSITY OF TEXAS ARLINGTON | OFFICE OF TECHNOLOGY MANAGEMENT

OPTICAL DELAY LINE ELEMENTS BASED ON LEAKY-MODE RESONANCE STRUCTURES

(UTA 10-14)

Technology Need:

Optical delays have a very important role in the Communication systems and radio-frequency photonics. Traditional dispersion engineering methods have resulted in the formation of many layers in the photonic devices. This results in the use of more materials, creating adhesion problems. Also, a significant amount of loss is created in the photonic devices. The traditional methods thus tend to be very expensive with a limited number of capabilities offered, giving little flexibility to the user.

Solution/ Offering:

Researchers at UTArlington have developed a new concept for dispersion engineering and slow-light applications. The concept can be used as a counterpart to other small-footprint devices. New representations of leaky mode resonance elements have been developed, which offer extremely compact delay, with a variety of features, exceeding that of other comparable devices. Tests have proved that the solutions provided by this concept are unique, with no similarity to that of the other devices. The transmission of light is in a delayed manner, with very low dispersion. These new concepts are beneficial to the Fiber Optic industry, by using them in optical buffers, delay lines and switches. The emphasis on these concepts, has been on creating flexibility and cost saving measures. The concept uses a minimum number of layers, which translates into the usage of lesser raw materials and minimal adhesion problems.

Value Proposition:

- ✓ Ultra Compact Size
- ✓ New Capabilities
- ✓ Lesser Material usage
  - Cost Effective

Industrial application:

- ✓ Fiber Optic Telecomm
- ✓ Optical Buffers
- ✓ Delay Lines
- ✓ Switches

Patent Status:

- ✓ Patent Pending US20110181946

Current Stage:

- ✓ Lab Tested

Meet the Inventor

Robert Magnusson is the Texas Instruments Distinguished University Chair in Nano Electronics and Professor of Electrical Engineering at UTArlington. He has served as an associate editor of Applied Optics and Optical Engineering and as general chair for the Diffractive Optics and Micro Optics topical meeting. His area of expertise include theory and experiment of periodic optical filters, diffractive optics, thin film optics, waveguide optics, holographic inferometry, optical properties of material.

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