Fiber Optic Force Sensing Transducer

Tech ID: 22917 / UC Case 2012-125-0

BACKGROUND
The ability to measure forces and/or mechanical displacements with high precision has direct implications on the development of advanced sensing platforms that can respond to acoustic, strain, pressure, and/or chemical signals. Measuring small forces (< 1 nN) is typically carried out by sophisticated instruments such as an optical trap (or optical tweezer) or atomic force microscope which acts as a calibrated force transducer that can directly measure the force and distance of a system. Both techniques offer excellent force sensitivity (piconewton range), but it would be extremely difficult to integrate these platforms into transportable, or embeddable, sensors that can detect stimuli such as sound waves, pressure changes, or chemicals.

TECHNOLOGY DESCRIPTION
University researchers have developed a highly versatile, fiber-based detection platform for measuring extremely small forces (< piconewtons) generated by various stimuli. In the invention, the movement of optical transmitters in the evanescent field of a subwavelength optical fiber, or more generally a waveguide, is used to detect forces imposing on the fiber. The invention provides a single element fiber optic force sensor that is highly tunable and can be configured for various applications including: nanomechanical sensors for medical research (cancer diagnostics, fundamental cellular studies, single molecule analytics, and real-time biological responses); fiber optic sensors tuned to detect sound waves (underwater receiver for marine-life research), chemicals, pressure/temperature changes; and scanning probes capable of imaging topography of planar and non-planar surfaces.

INTELLECTUAL PROPERTY INFO
The invention has a patent pending and is available for licensing and/or sponsorship.

RELATED MATERIALS

PATENT STATUS

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<td>United States Of America</td>
<td>Issued Patent</td>
<td>9,459,163</td>
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CATEGORIZED AS
- Optics and Photonics
  - All Optics and Photonics
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  - Physical Measurement

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