

US Pat. No.: 6,965,709

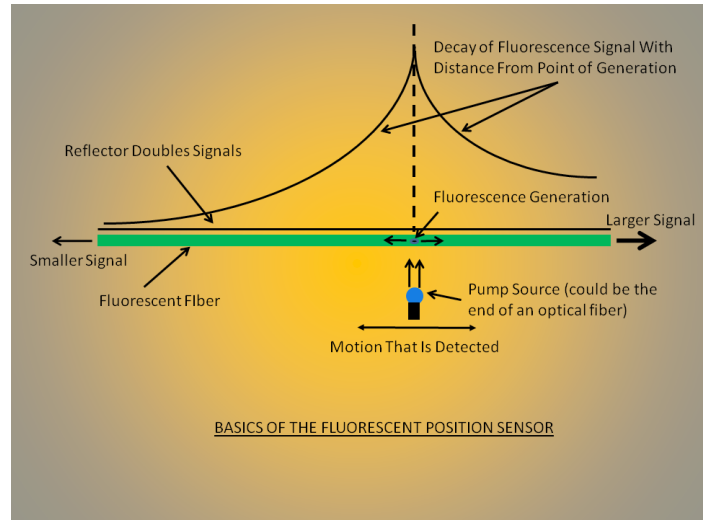
Technology Readiness Level: 5

Key elements of the technology have been demonstrated in relevant environments

Sandia National Laboratories has created a method and apparatus for measuring the position of an object. It relies on the attenuation of fluorescence light carried inside a fluorescent optical fiber to determine the position of an object.

As show in the figure, a small excitation source, such as a laser or LED, excites a localized area of fluorescence at an unknown position along the fluorescent fiber. As the fluorescent light travels down the fiber, the intensity of the fluorescent light decreases due to absorption. The ratio of the two signals from each end determines the position of the object along the fiber. Appropriate modulation of the excitation source causes ambient light to be of no consequence and allows one to measure the position of several objects simultaneously with a single fluorescent fiber and a single set of photodetectors.

The flexibility of the fluorescent fiber allows for the determination of positional changes that do not occur along a straight line. The use of an array of such fibers allows for the detection of two-dimensional changes in position.



Visual depiction of the basics of the fluorescent position

TECHNICAL BENEFITS

- Measures fluorescent light emitted from the waveguide
- Does not introduce electrical energy
- Insensitive to electromagnetic interference
- Provides continuous measurements
- Has few moving parts

INDUSTRIES & APPLICATIONS

- Hazardous environments
- Oil and gas drilling
- Mineral drilling
- Water well drilling