Reference: MCF Interferometer

COMPOSED MULTICORE OPTICAL FIBER INTERFEROMETER

Multicore fiber, mode interferometers, optical fiber sensors, sensor sensitivity enhancement, supermodes.

TYPE OF DEVELOPMENT

Fiber optics sensors, interferometry.

DESCRIPTION

In general, the present invention relates to optical fiber devices, and more particularly, to an interferometer that includes two segments of asymmetric multicore optical fiber of different lengths which are fusion spliced but rotated with respect to each other. The two segments of multicore fiber are spliced to conventional single mode optical fiber. The transfer function of the composed interferometer is the multiplication of the transfer functions of the individual multicore fiber interferometers. In this manner, the bending sensitivity of the composed interferometer is the multiplication of the sensitivities of the individual interferometers.

The composed interferometer can distinguish the direction of bending (or curvature) along with the magnitude of bending (or curvature). The interferometer is particularly interesting in applications where high bending sensitivity and fast response are required.

INDICATION

The interferometer is intended for different applications including direction-sensitive curvature sensing, mechanical vibration sensing, or for measuring any other parameter that can introduce a change in the reflected interference pattern.

NOVELTY/ANDVANTAGED

The text describes the construction and use of an MCF interferometer:

•The MCF interferometer produces a straightforward output spectrum pattern by multiplying the interference patterns of two MCF.
•Interferometers of lengths L1 and L2, respectively.
•The analysis of the resulting spectrum is simple as it has a well-defined maximum.
•The measuring range is wide.
•The sensitivity is amplified and higher than that of a single interferometer.

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STAGE DEVELOPMENT

TRL-3

COOPERATION GOAL

Licence agreement