Transverse Mode Selection of Fiber Bragg Gratings

Overview

We propose a novel approach for achieving selective transverse mode operation of few-mode all-fiber lasers. , limiting the brightness that can be achieved from the multi-mode system. In order to improve the brightness from such multi-mode systems, we present a method of transverse mode selection utilizing volume Bragg gratings (VBGs) as an angular fi ter, allowing for high beam quality from large mode. An Optical Fiber Bragg Grating (FBG) is a periodic modulation of the refractive index within the core of an optical fiber. This is achieved by creating a periodic variation in the refractive index of the fiber core, which generates a. The problem of finding solutions to the wave-propagation equations is simplified by assuming weak guidance, which allows the decomposition of the modes into an orthogonal set of transversely polarized modes [1-3].

Article Content

Multi-wavelength oscillating and transverse mode switching in an all ...

In summary, we experimentally demonstrate an all few-mode fiber laser that is capable of realizing multi-wavelength oscillation and transverse mode switching based on the polarization ...

Bragg Gratings in Optical Fibers: Fundamentals and Applications

Despite the improvements in optical fiber manufacturing and advancements in the field in general, basic optical components such as mirrors, wavelength filters, and partial reflectors have been a challenge ...

Fiber Bragg Gratings

Fiber Bragg gratings are reflective structures in the core of an optical fiber with a periodic or aperiodic perturbation of the effective refractive index.

Transverse mode selection in laser resonators using volume ...

, limiting the brightness that can be achieved from the multi-mode system. In order to improve the brightness from such multi-mode systems, we present a method of transverse mode selection ...

Mode-Locked Fiber Laser With Transverse-Mode Selection Based on ...

We demonstrate a passively mode-locked fiber laser that incorporates a two-mode fiber Bragg grating (FBG) for transverse-mode selection.

Selective transverse mode operation of an all-fiber laser with a mode ...

We propose a novel approach for achieving selective transverse mode operation of few-mode all-fiber lasers. Lasing in a specific transverse mode is enabled by employing a pair of few-mode fiber Bragg ...

Fiber Bragg grating

The first in-fiber Bragg grating was demonstrated by Ken Hill in 1978. Initially, the gratings were fabricated using a visible laser propagating along the fiber core. In 1989, Gerald Meltz and ...

Transverse mode selection and brightness enhancement in laser ...

This thesis explores the angular selectivity of volume Bragg gratings (VBGs) and their use as spatial transverse mode filters in a laser resonator. Selection of the fundamental mode of a resonator is ...

Theory of Fiber Bragg Gratings

These gratings couple from a forward-propagating guided mode to a back-ward-propagating cladding mode, or a continuum of radiation modes. In this section, a new and simple theory is presented to ...

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The underlying physics is governed by coupled-mode theory, where forward- and backward-propagating modes interact due to the refractive index perturbation. Mathematical Derivation of the Bragg ...

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