

Multicore Fiber Sensors for Simultaneous Measurement of Force and Temperature

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Abstract.

We demonstrate a force and temperature sensor consisting of a multicore fiber (MCF) spliced between two single-mode fibers. Increasing of the sensitivity to applied force is achieved through etching of the MCF cladding, with an overall increase of 7× compared with a 125- μm MCF device, and 12× compared with a standard fiber Bragg grating (FBG). Simultaneous decoupling of force and temperature with high accuracy is demonstrated using two MCF sections with different outer diameters. This device has robust operation up to 1000 °C, making it more suitable than FBGs for extreme environments.