Inline Microfiber Mach–Zehnder Interferometer for High Temperature Sensing

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A compact inline microfiber Mach-Zehnder interferometer (MMZI) is proposed for high temperature sensing. The MMZI is fabricated using a flame-brushing technique in which both transition parts of a microfiber are tapered to reduce the waist diameter and form an interference region. Since the refractive index of the fiber core exhibits a different temperature coefficient from that of air, the interferometer is sensitive to temperature variation. The temperature sensitivity of the device with a length of 40 mm was measured to be 13.4 pm/°C with an excellent linearity for temperature measurement up to 800°C.

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