

High Sensitivity Fiber Laser Temperature Sensor

Alejandro Martinez-Ríos, Gilberto Anzueto-Sanchez, Romeo Selvas-Aguilar, Arturo Alberto Castillo Guzman, Daniel Toral-Acosta, Valentin Guzman-Ramos, Victor M. Duran-Ramirez, J. Ascencion Guerrero-Viramontes, Carlos A. Calles-Arriaga

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Abstract

This paper presents an erbium-doped fiber laser temperature sensor, which is based on an intracavity fiber filter immersed in glycerol/water solutions. The sensing element is the intracavity fiber filter, consisting of a two-taper fiber Mach-Zehnder interferometer (MZFI). The high refractive index dispersion of glycerol/water solutions with temperature allowed the modification of the MZFI spectral characteristics and hence determines the lasing wavelength. The sensitivity of 1089 pm/°C and a signal-to-noise ratio of 50 dB make the proposed sensor suitable for real applications.