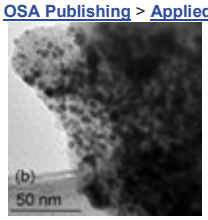
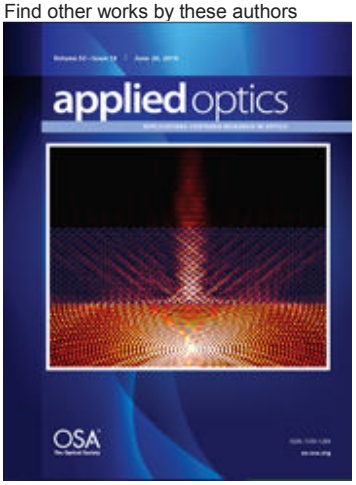


Plasmonic optical fiber sensors: enhanced sensitivity in water-based environments

Bárbara Rutyna Heidemann, Ismael Chiamenti, Marcela Mohallem Oliveira, Marcia Muller, and José Luís Fabris

Author Affiliations

Find other works by these authors



- **Applied Optics**

Vol. 54, Issue 27, pp. 8192-8197 (2015)
doi: 10.1364/AO.54.008192

Abstract

In this work, we demonstrate a refractometric fiber sensor with improved sensitivity for refractive indices ranging from 1.3629 to 1.4479. The device relies on the coupling between a long period grating (LPG) transducer and a localized surface plasmon resonance (LSPR). Sensor operation is based on the transference of energy from LPG cladding modes at the visible spectral range to the LSPR. The transducer consists of a long period grating 3.15-mm-long covered with 2–7 nm gold nanoparticles. The sensor is intensity coded at a 568 nm wavelength, presenting sensitivity of 208%/unit of refractive index for a refractive index of 1.39 and resolution better than 0.0003 for the dynamic range of refractive indices from 1.3629 to 1.4479.

Full Article | PDF Article