Plasmonic Optical Fiber Sensors using Different Nanoparticles

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Abstract

This paper presents an investigation on Localized Surface Plasmon based optical fiber sensor and comparative performance of design with nanoparticles of different material on the tip of fiber. It is found that the Silver nanoparticles have higher sensitivity of 300nm/RIU and 10.7 figure of merit when refractive index of surrounding varies from 1.33 to 1.36. Whereas the copper and aluminum have the sensitivity of 133nm, 333nm, figure of merit of 2.7 and 8.1 respectively. It is also observed that the Surface Plasmon Resonance curve of silver nanoparticles has narrow width which improves the detection of accuracy as compared to copper and aluminum.

References


Index Terms

Computer Science
Artificial Intelligence

Keywords

Optical fiber sensor, nano-particles, refractive index, Surface Plasmon Resonance.