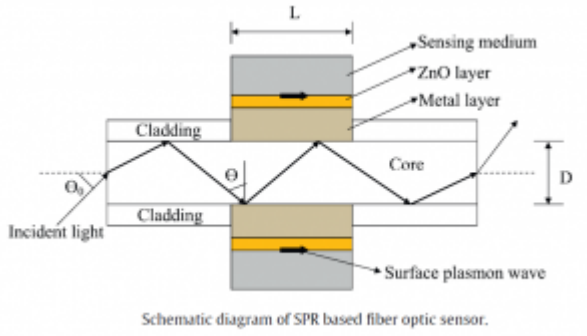
Sensitivity enhancement of a surface plasmon resonance based fiber optic sensor using ZnO thin film

In January 2015, Shukla et al., from department of physics and materials science and engineering of India have proposed a surface plasmon resonance (SPR) based fiber optic sensor with bi layers of metal–ZnO.



Schematic diagram of SPR based fiber optic sensor.

Three metals: gold (Au), silver (Ag) and copper (Cu) have been investigated. The top ZnO layer is shown to protect the metallic layer from oxidation and to enhance the sensitivity of the SPR sensor. Besides, the increase in the thickness of Au/Ag/Cu layer increases the sensitivity of SPR sensor for all thicknesses of ZnO layers. For a fixed thickness of ZnO layer, the sensitivity of sensor is larger for Au layer than that for Ag/Cu layer. Sensitivity also increases with increase in ZnO layer thickness for all thicknesses of Au/Ag/Cu layers. The SPR sensor based on bi layers of 40nm Au–15nm ZnO demonstrates the maximum sensitivity of 3161 nm/RIU.

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